GUIDANCE DOCUMENT

FOR USE ATTAINABILITY ANALYSES (UAAs)

December 1, 2001

Kansas Department of Health and Environment
Bureau of Environmental Field Services
1000 SW Jackson, Suite 430
Topeka, KS 66612

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USE ATTAINABILITY ANALYSIS (UAA) PROTOCOLS

I. Introduction

The Kansas surface water quality standards (K.A.R. 28-16-28b through 28-16-28f) establish water quality goals for all streams, lakes and wetlands occurring within the state or forming a portion of the border with an adjoining state. General narrative provisions in the standards extend a basic level of protection to all such waters, irrespective of size or ownership. "Classified" waterbodies comprise an important subset of the waters of the state, in that they are assigned specific beneficial uses under the standards and are subject to numeric water quality criteria and related regulatory provisions. The level of protection afforded by the standards may vary among classified waterbodies depending on their assigned uses and associated water quality criteria.

The beneficial uses of approximately 2,500 stream segments, lakes and wetlands are delineated in the Kansas Surface Water Register. This register also assigns unique identification numbers and geographical (latitude/longitude) descriptors to individual waterbodies based on U.S. EPA river reach files.

The protocols to develop use designations for surface waters in Kansas endeavors to provide scientifically defensible information on the existing and attainable uses of classified streams, lakes and wetlands. This information is intended for use in:

(1) complying with federal and state requirements for designating the beneficial uses of surface water (40CFR 131.10; K.A.R.28-16-28d);
(2) responding to changes in the capacity of surface waters to support the beneficial uses recognized under the Kansas standards;
(3) identifying and applying appropriate water quality criteria and related regulatory provisions in the development of National Pollutant Discharge Elimination System (NPDES) permit limits, and total maximum daily loads (wasteload allocations & load allocations);
(4) responding to possible future changes in the wording of the Kansas standards with respect to the beneficial uses of surface water; and
(5) responding to requests by permitted facilities and other interested stakeholders to review designated uses of surface waters.

Separate protocols have been developed for determining aquatic life support uses, primary/secondary contact recreation use (including food procurement), and water supply uses. These protocols have been developed for use by external clients of the Kansas Department of Health and Environment for the development and submission of UAAs to the KDHE for review.

II. Implementation Procedures*

UAAs should be submitted to the Director, Bureau of Environmental Field Services,

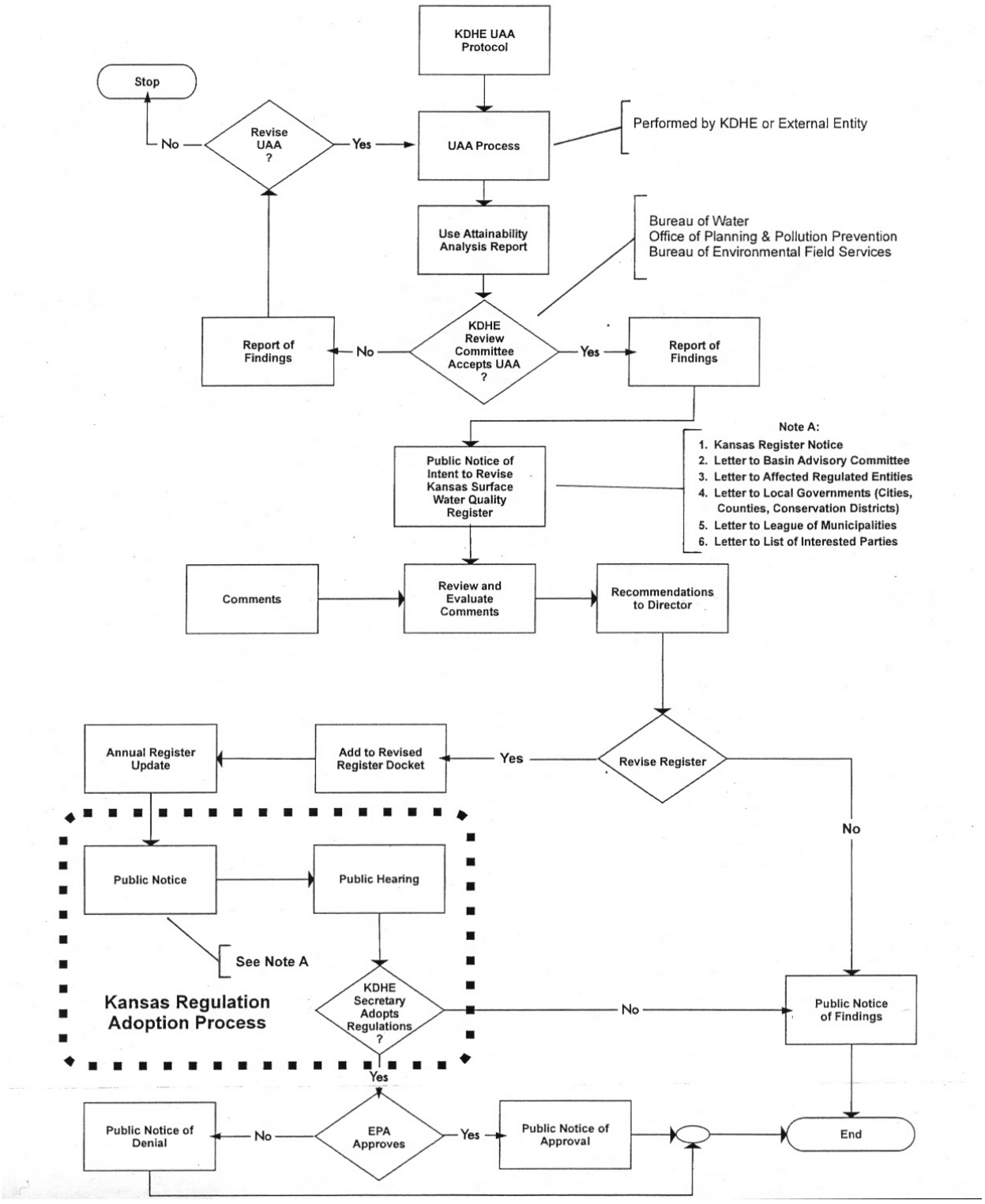
Kansas Department of Health and Environment, 1000 SW Jackson, Suite 430, Topeka, Kansas 66612 for review. An internal KDHE review committee will meet quarterly, or more frequently if needed, to review all UAAs for accuracy, completeness and adequacy of statement of findings. If the UAA meets the stated criteria, it will be forwarded to the Data Management Section as a proposed change to the Kansas Surface Water Register. A written response to the entity submitting the UAA will be prepared by the Bureau of Environmental Field Services.

The Surface Water Quality Commission recommended that the Basin Advisory Committees assist the KDHE in examining the designated uses of streams within their basins. The basin advisory committees were established in 1985 for the twelve major river basins to advise the Kansas Water Office and Kansas Water Authority on local water issues. As UAAs are completed and changes proposed, the proposed changes will be forwarded to the appropriate Basin Advisory Committee for discussion and review at their stated meetings.

The Kansas Surface Water Register is adopted by reference in K.A.R. 28-16-28d(c)(2). K.A.R. 28-16-28d will be updated annually by the Bureau of Environmental Field Services to amend the register to reflect the findings of UAAs. A flow chart depicting the internal KDHE process for development of regulations is attached. The policies and procedures for filing Kansas Administrative Regulations, as developed by the Department of Administration to implement K.S.A. 77-415 through 77-437, will be followed (flow chart attached). These procedures include public notice and a public hearing on proposed regulatory changes. All entities who have submitted a UAA will be notified directly of the public hearing related to adoption of the revised register. UAAs and subsequent revisions to the Kansas surface water quality standards are subject to approval by the Regional Administrator, U.S. EPA (40CFR131.20(c)

* Flow chart attached.

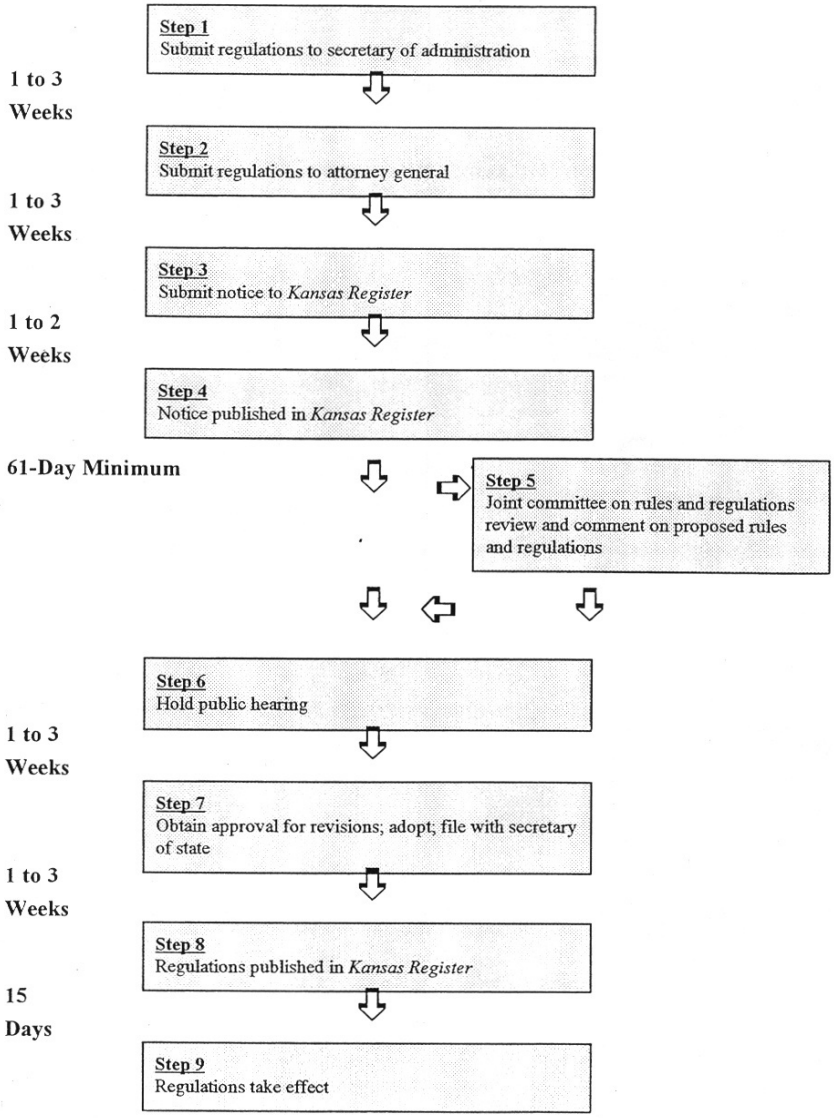
Kansas Use Attainability Analysis Process



KANSAS REGULATION ADOPTION PROCESS

PERMANENT REGULATIONS

Total Time: 111 to 174 days
16 to 25 weeks



PROTOCOL FOR CONDUCTING

USE ATTAINABILITY ANALYSIS (UAA)

FOR

AQUATIC LIFE USE

USE ATTAINABILITY ANALYSIS (UAA)
FOR
AQUATIC LIFE USE

Waterbody Name _____ Basin _____
Date _____ HUC _____
Segment _____
Stream Chemistry Network Station (if applicable) _____

DEFINITIONS

Aquatic life support use means the use of surface waters for the maintenance of the ecological integrity of streams, lakes and wetlands. This includes the sustained growth and propagation of native aquatic life; naturalized, important, recreational aquatic life; and indigenous or migratory semiaquatic or terrestrial wildlife directly or indirectly dependent on surface water for survival.

In Kansas, the aquatic life support use is further designated as one of three subcategories: special aquatic life use, expected aquatic life use, and restricted aquatic life use.

1. Special aquatic life use (SALU) is assigned to surface waters which have the potential to contain combinations of habitat types and indigenous aquatic life not commonly found in the state, as well as waters containing or potentially containing populations of threatened or endangered (T & E) species.
2. Expected aquatic life use (EALU) is assigned to surface waters containing habitat types and indigenous aquatic life commonly found in Kansas. Essentially, this use is the "default" designation.

3. Restricted aquatic life use (RALU) is assigned to surface waters where indigenous aquatic life is limited in abundance or diversity due to natural deficiencies in, or artificial modifications to, the physical quality of the habitat

PREPARATION FOR UAA

Review all applicable files, databases and maps in order to become thoroughly familiar with the waterbody to be inspected and to determine what sampling should be accomplished. Indicate which resources have been reviewed and/or condition satisfied.

X = resource checked or condition satisfied
O = resource not available or condition not satisfied

The following materials are available from Kansas Department of Wildlife and Parks (KDWP):
_____ fishery resource maps and designations
_____ stream survey maps and collection information
_____ critical habitat maps for T&E species

_____ fish collection records from KDWP stream surveys

Published and unpublished stream fish collection data are also available from:
_____ Kansas Department of Health and Environment (KDHE)
_____ Fort Hays State University
_____ University of Kansas Museum of Natural History
_____ Kansas Biological Survey, Natural Heritage Program

Unionid mussel collection records and other macroinvertebrate records are available from:
_____ Kansas Biological Survey, Natural Heritage Program
_____ KDHE (KDHE Mussel Database)
_____ Fort Hays State University
_____ Wichita State University

Records of collection, observation and reproduction of other aquatic and semi-aquatic wildlife, including reptiles, amphibians and birds, are available from:
_____ Emporia State University
_____ Kansas State University
_____ Kansas Ornithological Society
_____ Kansas Herpetological Society
_____ Kansas Biological Survey, Natural Heritage Program

DOCUMENTATION OF LITERATURE SEARCH

Identify all known aquatic and semiaquatic species associated with the waterbody and cite the literature or database source.

USE ASSESSMENT PROCEDURES

Aquatic life support use shall be considered to be existing in all currently classified waterbodies in Kansas and attainable if the waterbody meets the criteria for classification set forth in L2001, ch.100, sec.1, which describes classified streams as follows:

_____ 1. Classified streams shall include:

_____ A. All streams with a 10-year median flow of equal to or in excess of 1 cubic foot per second (1.0 cfs). Regardless of flow, a stream shall be classified if studies conducted or accepted by the department show that pooling of water during periods of zero flow provides important refuges for aquatic life and permits biological recolonization of intermittently flowing segments and a cost/benefit analysis indicates that the benefits of classifying the stream outweigh the costs of classifying the stream.

_____ B. All streams actually inhabited by threatened or endangered aquatic species listed in rules and regulations promulgated by the Kansas Department of Wildlife and Parks or the U.S. Fish and Wildlife Services.

_____ C. All streams which are at the point of discharge and downstream from such point where the Department has issued a National Pollutant Discharge

Elimination System Permit other than a permit for a confined feeding facility.

_____ 2. Classified lakes shall be all lakes owned by federal, state, county or municipal authorities and all privately owned lakes that serve as public drinking water supplies or that are open to the general public for primary or secondary contact recreation. (K.A.R. 28-16-28d)

_____ 3. Classified wetlands shall be all wetlands owned by federal, state, county, or municipal authorities, all privately owned wetlands open to the general public for hunting, trapping or other forms of secondary contact recreation, and all wetlands classified as outstanding national resource waters, exceptional state waters, or designated as special aquatic life use waters....". (K.A.R. 28-16-28d)

Special aquatic life use (SALU) - This use shall be considered existing if the waterbody segment is:
_____ designated as critical habitat for T&E species, or
_____ is found to contain T&E species or species in need of conservation (SINC) during field collection activities.

The special aquatic life use shall be considered attainable if:
_____ the waterbody falls within the geographic range of T&E or SINC species, and
_____ possesses hydrologic and habitat components consistent with the known requirements of these species.

Restricted aquatic life use (RALU) - This use shall be assigned to surface waters if:
_____ indigenous aquatic life is limited in abundance or diversity by the physical quality of the habitat due to natural deficiencies or artificial modifications.

Examples of such natural deficiencies or modifications are:
_____ concrete lined diversion canals,
_____ subterranean aqueducts, and
_____ channels so extensively modified that no natural or artificially provided habitat is present.

Expected aquatic life use (EALU) - This is the default designation for aquatic life support. It is assigned when
_____ the waterbody is classified, and
_____ not designated as SALU or RALU.

The Expected aquatic life use shall be considered attainable when:
_____ the waterbody meets the State's criteria for classification,
The Expected aquatic life use shall be considered existing when:
_____ the waterbody is classified and aquatic life is known to be present.

Cost effective best management practices for non-point sources are found in Appendix A.

FIELD ASSESSMENT PROCEDURES FOR AQUATIC LIFE USE DESIGNATIONS

If there is insufficient information concerning resident aquatic communities, it will be necessary to document the aquatic life community through field assessments. Field assessments must be conducted by a qualified aquatic biologist. A qualified aquatic biologist includes any person with appropriate post-secondary coursework in aquatic biology, aquatic ecology, aquatic invertebrate zoology, ichthyology, and/or limnology combined with field experience in the identification of aquatic and semiaquatic species native to Kansas.

1. Field activities begin with a visual inspection of the targeted waterbody at several randomly selected locations. Those locations deemed most representative of the waterbody are selected for further study. If a site is believed to afford unusual or outstanding biological habitat, it is included as an additional study location even if it is unrepresentative of the waterbody as a whole. This increases the likelihood that rare or unusual biological assemblages will be identified and assigned an appropriate level of protection under the water quality standards. For a lake or wetland, one site may be adequate to characterize existing or potential uses. Stream or river UAAs will generally have more sites (a minimum of three) due to the possibility of anomalous habitat conditions at any given access point. Stream sites (reaches) selected for study should extend in length at least ten times the width of the stream as measured from the high water mark, i.e., top of the stream banks.

2. Assessment sites shall be designated for each UAA and clearly marked on 1:24,000 scale (7.5 minute series) United States Geological Survey (USGS) topographic maps (available at: www.topozone.com). If possible, global positioning system (GPS) coordinates should be taken on-site and recorded on field forms.

3. If access to the waterbody is to be made on private property, landowner or resident permission should be secured prior to access (K.S.A. 21-3721).

4. Narrative UAA site assessments are to be clearly recorded, either by electronic or written means, at each assessment site. To eliminate risk of mistakes or confusion regarding uses among multiple sites, record observations before moving to the next assessment site.

   The written assessment must specify the targeted waterbody, its legal location, GPS coordinates (if available), field physical and chemical data, photographic exposure information, stream width, depth and flow estimations, habitat types present, existing uses actually observed, observations of unusual conditions such as algal blooms, dead fish or unusual odors, streambank water diversions or alluvial wells (located within 50 feet of the waterbody), observations of aquatic life such as fish or mussels, and observations of semiaquatic life such as amphibians, waterfowl, or furbearers. Complete forms APP. D-1 through D-5, as appropriate to the type of waterbody.

5. At a minimum, dissolved oxygen, pH, specific conductance, and temperature must be measured at each assessment site and documented on the appropriate stream, lake or wetland physical characterization data sheet. Sample collection and analysis

must follow the standard methods described in *Standard Methods for the Examination of Water and Wastewater, 17th Ed.*, 1989 (or later edition), Washington DC: American Public Health Association.

6. A photographic record must be made of sites assessed for the UAA. Photographs must include an upstream view, downstream view, and any photographs required to document observed or potential uses. Photographs must be marked or catalogued in a manner which indicates the site location and sampling date and what is being shown by each photograph.

7. If possible, streamside or other local landowners or residents should be interviewed regarding present or past uses of the waterbody and any social benefits of the waterbody. Persons interviewed should be identified by name and legal address in the written assessment.

8. Biological community sampling will normally focus on two groups of organisms, fish and molluscs. Numerous fish and mollusc species are listed as T&E or SINC species and often form the basis for designating a waterbody segment either SALU or EALU. Juvenile forms of aquatic insects may also be collected to assist in designation of the waterbody segment. Forms APP D-6 and C-3 relate to the collection, preservation and identification of aquatic and semiaquatic species. Complete as appropriate.

9. Prior to any fish or mollusc collection activities, a scientific collector's permit **must** be obtained from Kansas Department of Wildlife & Parks (phone 316-672-5911) and, if federally protected species are likely to be encountered, United States Fish & Wildlife Service (USFWS) (phone 303-236-7920).

10. Fish collection procedures must focus on a multi-habitat approach, allowing the sampling of habitats in relative proportion to their local availability. Each sample reach should contain riffle, run and pool habitats, if present. If possible, the sample reach should be located away from the influences of point and localized nonpoint sources of pollution and channelized bridge or road crossings. Ability to access and wade the waterbody may ultimately govern the exact placement of the sample reach.

    Each type of available habitat (riffle, run, pool, undercut banks, aquatic vegetation, etc.) must be sampled extensively until no new species are found in repeated seine hauls. This means at least three consecutive seine hauls with no new species, even under optimal seining conditions. Sub-optimal seining conditions may require more extensive sampling activities, guided by the professional judgement of the aquatic biologist conducting the sampling. The use of electrofishing equipment is an alternate method for sampling and enumerating fish communities. Habitat assessment worksheets, appropriate for the type of waterbody, (Forms APP. D-1 through D-5) must be completed to document habitats present and sampled.

11. Fish (except young-of-the-year) collected within the sample reach must be identified

to species (or subspecies) and enumerated. Field identifications are acceptable; however voucher specimens should be retained for laboratory verification, particularly if there is any doubt about the correct identity of the specimen. Specimens that cannot be identified with certainty in the field must be preserved in a 10 percent formalin solution and stored in labeled containers for subsequent laboratory identification. A representative voucher collection must be retained for unidentified specimens, very small specimens, and new locality records.

In addition to the unidentified specimen jar, a voucher collection of a sub-sample of each species identified in the field must be preserved and labeled for subsequent laboratory verification (with the exception of large, readily identifiable species - i.e., carp, flathead catfish, etc., for which photographic documentation may suffice).

At a minimum labels must display location data (verbal description and legal coordinates), collection date, collectors' names, and sample identification code or station number for the particular sampling site.

Voucher specimens and collections must be made available to KDHE for verification and/or cataloguing in the collection of the University of Kansas Museum of Natural History, Division of Fishes.

Immediately following the data recording phase of the procedure, specimens that have been identified and enumerated in the field should be released on-site to minimize mortality.

12. Identification of fish must be conducted by a qualified aquatic biologist familiar with taxonomy of local and regional ichthyofauna. The accurate identification of each fish collected is essential and species-level identification is required. Questionable records are prevented by: a) requiring the presence of at least one qualified aquatic biologist with experience in fish taxonomy on every sampling effort, and b) preserving selected specimens which cannot be readily identified in the field for laboratory verification. It is recommended that a maximum sub-sample size of 25 specimens of each species be collected. Only one or two specimens need to be collected of T&E and SINC species. Taxonomic nomenclature must be kept consistent and current. Common and scientific names of fishes are listed in *Common and Scientific Names of Fishes from the United States and Canada*, *5th edition,* American Fisheries Society, Special Publication 20. Bethesda, Maryland, 1991.

13. Unionid mussels present at the sample points must be identified and recorded. Live unionid mussels should be recorded, photographed, and immediately released on-site (with the possible exception of voucher specimens). Photographic documentation is especially important for T&E and SINC species, which should generally be released on-site. Remnant valves (recent, weathered and semi-fossil) must be collected in numbers proportional to their presence and made available to KDHE for identification, cataloguing and archiving.

14. Unionid mussels encountered within the sample reach must be identified to species (or subspecies) and enumerated. Voucher specimens must be retained for laboratory verification if there is any doubt about the correct identity of the specimen. Live specimens that cannot be identified with certainty in the field should be preserved individually in a 10 percent formalin solution and stored in labeled containers for subsequent laboratory identification. A representative voucher collection must be retained for unidentified and very small live specimens in the absence of recently deceased specimens or unweathered shell materials. Voucher specimens must be clearly labeled for subsequent laboratory verification. At a minimum labels must display location data (verbal description and legal coordinates), collection date, collectors' names, and sample identification code or station number for the particular sampling site.

    Preserved voucher specimens and collected shell materials must be made available to KDHE for verification and/or cataloguing in the KDHE mussel collection or other appropriate repository (e.g., University of Kansas Museum of Natural History).

    Immediately following the data recording phase of the procedure, any live specimens that have been identified and enumerated in the field should be carefully released on-site to minimize mortality.

15. Identification of unionid mussels must be conducted by a qualified aquatic biologist familiar with the taxonomy of local and regional unionid mussel fauna. The accurate identification of each unionid mussel collected is essential and species-level identification is required. Questionable records are prevented by: a) requiring the presence of at least one qualified aquatic biologist familiar with taxonomy of unionid mussels on every field effort, and b) preserving selected specimens (live individuals or unweathered valves) of each species and those which cannot be readily identified in the field for laboratory verification. Taxonomic nomenclature must be kept consistent and current. Common and scientific names of unionid mussels are listed in *Common and Scientific Names of Aquatic Invertebrates from the United States and Canada: Mollusks, 2nd edition*, American Fisheries Society, Special Publication 26, Bethesda, Maryland, 1998.

FINDINGS OF AQUATIC LIFE USE UAA

A written statement of finding and all supporting documentation must be presented to KDHE for review. The statement must include pertinent findings that support the designation being proposed for adoption in the Kansas Surface Water Quality Standards, K.A.R. 28-16-28d. If field and taxonomic assessments have been conducted a statement of the qualifications of the participating biologists must be included.

Form E-1

FIELD ASSESSMENT WORKSHEET

USE ATTAINABILITY ANALYSIS (UAA)
FOR
AQUATIC LIFE USE

Waterbody Name:_____ HUC:_____
Basin: _____ Segment:_____

Location (Legal):____1/4 ____ 1/4 Sec.____ Township.____ Range____ Quadrangle _____

Evaluators:_____ Date:_____
Site Location Map or attach photographs:

Economic Considerations:

What activities are apparent along the stream that might impact the water quality of the stream segment, i.e. discharges, crop land, grazing activities, etc.?

_____
_____
_____

FORMS
APP. C-3 and
APP. D-1 through D-6

Form App. C-3

KDHE/BEFS

IDENTIFICATION BENCH SHEET

STATION_____ STREAM/LOCATION_____

DATE COLLECTED_____ DATE EXAMINED_____ DETERMINED BY_____

COLLECTOR(S)_____ TYPE OF SAMPLE (EFFORT)_____

	KBS CODE #	A #	N #	L #	P #	TOTAL #		KBS CODE #	A #	N #	L #	P #	TOTAL #
COLEOPTERA							MEGALOPTERA						
							ODONATA						
							PLECOPTERA						
DIPTERA													
							TRICHOPTERA						
							CRUSTACEA						
EPHEMEROPTERA													
							GASTROPODA						
							HIRUDINEA						
							OLIGOCHAETA						
							PELECEPODA						
							TURBELLARIA						
HEMIPTERA													
							OTHER						

KBS CODE#=KDHE KANSAS BIOSYSTEM TAXON UNIQUE CODE A#=NUMBER OF ADULTS IN SAMPLE
N#=NUMBER OF NYMPHS IN SAMPLE L#=NUMBER OF LARVAE IN SAMPLE
P#=NUMBER OF PUPAE IN SAMPLE

TOTAL ORGANISMS_____ TOTAL TAXA_____ EPT INDEX_____ MBI_____ MBI(N)_____ HDI_____ D.O._____

SHEET_____OF_____

Form App. D-1

Stream Physical Characterization/Water Quality Field Data Sheet
(Front)

Stream Name:		Location:	
Station #:	Rivermile:	Legal Descr:	
Lat:	Long:	River Basin:	
Storet #:		Agency:	
Investigators:			
Form Completed By:		Date:	Reason For Survey:
		Time: AM PM	

Weather Conditions	**Now**	**Past 24 hours**	**Has there been a heavy rain in the last 7 days?**
	O	O storm (heavy rain)	O Yes O No
	O	O rain (steady rain)	
	O	O showers (intermittent)	**Air Temperature:____C**
	O ___%	O ___% cloud cover	**Other:_____**
	O	O clear/sunny	
Site Location/Map	Draw a map of the site and indicate the area sampled (or attach a photograph)		
Stream Characterization	**Stream Subsystem** O Perennial O Intermittent O Ephemeral **Stream Origin** O Spring-fed O Mixture of origins O Other _____		**Catchment Area _____ km ^{2}** Ecoregion: _____ Stream Order: _____

Stream Physical Characterization/Water Quality Field Data Sheet
(Back)

Watershed Features	**Predominant Surrounding Landuse** O Forest O Commercial O Field/Pasture O Industrial O Agricultural O Other _____ O Residential **Local Watershed NPS Pollution** O No evidence O Some potential sources O Obvious sources **Local Watershed Erosion** O None O Moderate O Heavy
Riparian Vegetation (18 meter buffer)	**Indicate the dominant type and record the dominant species present** O Trees O Shrubs O Grasses O Herbaceous O None **dominant species present:** _____
Instream Features	**Estimated Stream Width:_____m** **Estimated Stream Depth:_____m** **Surface Velocity (at thalweg):_____m/sec** **Estimated Reach Length:_____m** **High Water Mark:_____m** **Canopy Cover** O Partly open O Partly Shaded O Shaded **Proportion of Reach Represented by Stream Morphology Types** O Riffle:_____% O Run:_____% O Pool:_____% **Channelized** O Yes O No **Dam Present** O Yes O No
Aquatic Vegetation	**Indicate the dominant type and record the dominant species present** O Rooted emergent O Rooted submergent O Rooted floating O Free floating O Floating Algae O Attached Algae **dominant species present:** _____ **Portion of the reach with aquatic vegetation:_____%**
Water Quality	**Temperature:_____C** **Specific Conductance:_____** **Dissolved Oxygen:_____** **pH:_____ Turbidity:_____** **WQ Instrument Used:_____** **Other WQ Samples Collected?** Y __ N __ **Water Odors** O Normal/None O Sewage O Petroleum O Chemical O Fishy O Other_____ **Water Surface Oils** O Slick O Sheen O Globs O Flecks O None O Other_____ **Turbidity (if not measured** O Color _____ O Clear O Slightly turbid O Turbid O Opaque O Stained O Other_____
Sediment/ Substrate	**Odors** O Normal O Sewage O Petroleum O Chemical O Anaerobic O None O Other:_____ **Oils** O Absent O Slight O Moderate O Profuse **Deposits** O Sludge O Sawdust O Paper fiber O Sand O Relic shells O Other_____ **Looking at stones which are not deeply embedded, are the undersides black in color?** O Yes O No

Inorganic Substrate Components/Embeddedness (should add up to 100%)		
Substrate Type	Diameter	% Composition in Sampling Reach
Bedrock		
Boulder	> 256 mm (10")	
Cobble	64-256 mm (2.5-10")	
Gravel	2-64 mm (0.1-2.5")	
Sand	0.06-2 mm (gritty)	
Silt	0.004-0.06 mm	
Clay	< 0.004 mm (slick)	

Organic Substrate Components (does not necessarily add up to 100%)		
Substrate Type	Characteristic	% Composition in Sampling Area
Detritus	sticks, wood, coarse plant materials (CPOM)	
Muck-Mud	black, very fine organic (FPOM)	
Marl	grey, shell fragments	

Form App. D-2

Stream Habitat Assessment Field Data Sheet
(Front)

Stream Name:		Location:	
Station #:	Rivermile:	Legal Descr:	
Lat:	Long:	River Basin:	
Storet #:		Agency:	
Investigators:			
Form Completed By:		Date:	Reason For Survey:
		Time: AM PM	

Habitat Parameter	Conditions Category			
	Optimal	Suboptimal	Marginal	Poor
1. Epifaunal Substrate/ Available Cover	Greater than 50% of substrate favorable for epifaunal colonization and fish cover; mix of snags, submerged logs, undercut banks, cobble or other stable habitat and at stage to allow full colonization potential (Ie., logs/snags that are not new fall and not transient).	30-50% mix of stable habitat; well-suited for full colonization potential; adequate habitat for maintenance of populations; presence of additional substrate in the form of newfall, but not yet prepared for colonization (may rate at high end of scale).	10-30% mix of stable habitat; habitat availability less than desirable; substrate frequently disturbed or removed.	Less than 10% stable habitat; lack of habitat is obvious; substrate unstable or lacking.
2. Substrate Characterization	Mixture of substrate materials, with gravel and firm sand prevalent; root mats and submerged vegetation common.	Mixture of soft sand, mud, or clay; mud may be dominant; some root mats and submerged vegetation present.	All mud or clay or sand bottom; little or no root mat; no submerged vegetation.	Hard-pan clay or bedrock; no root mat or vegetation.
3. Pool Variability	Even mix of large-shallow, large-deep, small-shallow, small-deep pools present.	Majority of pools large-deep; very few shallow.	Shallow pools much more prevalent than deep pools.	Majority of pools small-shallow or pools absent.
4. Sediment Deposition/ Embeddedness	Little or no enlargement of islands or point bars and less than 5% (20% for low-gradient streams) of the bottom affected by sediment deposition.	Some new increase in bar formation, mostly from gravel, sand of fine sediment; 5-30% (20-50% for low-gradient) of the bottom affected; slight deposition in pools.	Moderate deposition of new gravel, sand or fine sediment on old and new bars; 30-50% (50-80% for low gradient) of the bottom affected; sediment deposits at obstructions, constrictions, and bends; moderate deposition of pools prevalent.	Heavy deposits of fine material, increased bar development; more than 50% (80% for loow-gradient) of the bottom changing frequently; pools almost absent due to substantial sediment deposition.
5. Channel Flow Status	Water reaches base of both lower banks, and minimal amount of channel substrate is exposed.	Water fills >75% of the available channel; or <25% of channel substrate is exposed.	Water fills 25-75% of the available channel, and/or riffle substrates are mostly exposed.	Very little water in channel and mostly present as standing pools.

Stream Habitat Assessment Field Data Sheet
(Back)

Habitat Parameter	Conditions Category			
	Optimal	Suboptimal	Marginal	Poor
6. Channel Alteration	Channelization or dredging absent or minimal; stream with normal pattern.	Some channelization present, usually in areas of bridge abutments; evidence of past channelization, i.e., dredging, (greater than past 20 yr) may be present, but recent channelization is not present.	Channelization may be extensive; embankments or shoring structures present on both banks; and 40 to 80% of stream reach channelized and disrupted.	Banks shored with gabion or cement; over 80% of the stream reach channelized and disrupted. Instream habitat greatly altered or removed entirely.
7. Channel Sinuosity	The bends in the stream increase the stream length 3 to 4 times longer than if it was in a straight line. (Note - channel braiding is considered normal in sandy bottomed streams, esp. in W. Kansas). This parameter is not easily rated in these areas.	The bends in the stream increase the stream length 2 to 3 times longer than if it was in a straight line.	The bends in the stream increase the stream length 2 to 1 time longer than if it was in a straight line.	Channel straight; waterway has been channelized for a long distance.
8. Bank Stability (score each bank) Note: determine left or right side by facing downstream.	Banks stable; evidence of erosion or bank failure absent or minimal; little potential for future problems. < 5% of bank affected.	Moderately stable; infrequent, small areas of erosion mostly healed over. 5-30% of bank in reach has areas of erosion.	Moderately unstable; 30-60% of bank in reach has areas of erosion; high erosion potential during floods.	Unstable; many eroded areas; raw" areas frequent along straight sections and bends; obvious bank sloughing; 60- 100% of bank has erosional scars.
left bank				
right bank				
9. Vegetative Protection (score each bank) Note: determine left or right side by facing downstream.	More than 90% of the streambank surfaces and immediate riparian zone covered by native vegetation, including trees, understory shrubs, or native grasses; vegetative disruption through grazing or mowing minimal or not evident; almost all plants allowed to grow naturally.	70-90% of the streambank surfaces covered by native vegetation, but one class of plants is not well-represented; disruption evident but not affecting full plant growth potential to any great extent; more than one-half of the potential plant stubble height remaining.	50-70% of the streambank surfaces covered by vegetation; disruption obvious; patches of bare soil or closely cropped vegetation common; less than one-half of the potential plant stubble height remaining.	Less than 50% of the streambank surfaces covered by vegetation; disruption of streambank vegetation is very high; vegetation has been removed to 5 centimeters or less in average stubble height.
left bank				
right bank				
10. Riparian Vegetative Zone (score each bank) Note: determine left or right side by facing downstream.	Width of riparian zone >18 meters; human activities (Ie., parking lots, roadbeds, clear-cuts, lawns, or crops) have not impacted zone.	Width of riparian zone 12-18 meters; human activities have impacted zone only minimally.	Width of riparian zone 6-12 meters; human activities have impacted zone a great deal.	Width of riparian zone <6 meters; little or no riparian vegetation due to human activities.
left bank				
right bank				

Form App. D-3

Lake Physical Characterization/Water Quality Field Data Sheet
(Front)

Lake Name:		Location:	
Station #:		Legal Descr:	
Lat:	Long:	River Basin:	
Storet #:		Agency:	
Investigators:			
Form Completed By:		Date:	Reason For Survey:
		Time: AM PM	

Weather Conditions	**Now**	**Past 24 hours**	**Has there been a heavy rain in the last 7 days?**
	O	O storm (heavy rain)	O Yes O No
	O	O rain (steady rain)	
	O	O showers (intermittent)	**Air Temperature:**_____**C**
	O ___%	O ___% cloud cover	**Other:**_____
	O	O clear/sunny	
Site Location/Map	Draw a map of the site and indicate the area sampled (or attach a photograph)		
Lake Physical Characteristics	Lake Acreage: _____	Watershed Acreage: _____	
	Zmax: _____	Watershed/Lake ratio: _____	
	Zmean: _____		
Lake Characterization	**Stream Subsystem (if applicable)**		
	O Perennial O Intermittent O Ephemeral **Catchment Area** _____ **km** ^{2}		
	Lake Origin		
	O Spring-fed	O Stream or River-fed	
	O Overland runoff		
	O Other _____	Ecoregion: _____	

Lake Physical Characterization/Water Quality Field Data Sheet
(Back)

Watershed Features	**Predominant Surrounding Landuse (%)** Forest _____ Commercial _____ Field/Pasture _____ Industrial _____ Agricultural _____ Other _____ Residential _____ **Local Watershed NPS Pollution** O No evidence O Some potential sources O Obvious sources **Local Watershed Erosion** O None O Moderate O Heavy
Riparian Vegetation (18 meter buffer)?	**Indicate the dominant type and record the dominant species present** O Trees O Shrubs O Grasses O Herbaceous O None **dominant species present:** _____
Aquatic Vegetation	**Indicate the dominant type and record the dominant species present** O Rooted emergent O Rooted submergent O Rooted floating O Free floating O Floating Algae O Attached Algae **dominant species present:** _____ **Portion of the reach with aquatic vegetation: _____% cover _____% volume infested**
Water Quality	**Temperature: _____C** **Dissolved Oxygen: _____** **Specific Conductance: _____** **Secchi Depth: _____** **Nutrients:** **Total N: _____ pH: _____** **Total P: _____ Turbidity: _____** **Chlorophyll: _____** **WQ Instrument Used: _____** **Other WQ Samples Collected?** Y __ N __ **Water Odors** O Normal/None O Sewage O Petroleum O Chemical O Fishy O Other _____ **Water Surface Oils** O Slick O Sheen O Globs O Flecks O None O Other _____ **Turbidity (if not measured** O Color _____ O Clear O Slightly turbid O Turbid O Opaque O Stained O Other _____
Sediment/ Substrate	**Odors** O Normal O Sewage O Petroleum O Chemical O Anaerobic O None O Other: _____ **Oils** O Absent O Slight O Moderate O Profuse **Deposits** O Sludge O Sawdust O Paper fiber O Sand O Relic shells O Other _____ **Looking at stones which are not deeply embedded, are the undersides black in color?** O Yes O No

Inorganic Substrate Components/Embeddedness (should add up to 100%)		
Substrate Type	Diameter	% Composition in Sampling Reach
Bedrock		
Boulder	> 256 mm (10")	
Cobble	64-256 mm (2.5-10")	
Gravel	2-64 mm (0.1-2.5")	
Sand	0.06-2 mm (gritty)	
Silt	0.004-0.06 mm	
Clay	< 0.004 mm (slick)	

Organic Substrate Components (does not necessarily add up to 100%)		
Substrate Type	Characteristic	% Composition in Sampling Area
Detritus	sticks, wood, coarse plant materials (CPOM)	
Muck-Mud	black, very fine organic (FPOM)	
Marl	grey, shell fragments	

Form App. D-4

Lake Habitat Assessment Field Data Sheet

Lake Name:		Location:	
Station #:		Legal Descr:	
Lat:	Long:	River Basin:	
Storet #:		Agency:	
Investigators:			
Form Completed By:		Date:	Reason For Survey:
		Time: AM PM	

Habitat Parameter	Conditions Category			
	Optimal	Suboptimal	Marginal	Poor
1. Available Cover and habitat	hypolimnion volume < 15 %, areal macrophyte cover 30 - 60 %, maximum depth > 5 m, mean depth > 3 m.	hypolimnion volume < 25 %, areal macrophyte cover 20 - 30 % or 70 90 %, maximum depth < 5 m, mean depth < 3 m.	hypolimnion volume < 35 %, areal macrophyte cover < 20 % or > 90 %, maximum depth < 4 m, mean depth < 2 m.	hypolimnion volume > 35 %, macrophytes absent or infesting almost whole lake volume maximum depth < 2 m, mean depth < 1 m.
2. Pool Variability	stable pool all year			large annual level changes
3. Sediment Deposition	areal sediment deposition < 1 cm / year, mostly in old channels	areal sediment deposition 1 - 2 cm / year, mostly in old channels and upstream zones	areal sediment deposition 1 - 2 cm / year, significant amount across entire lake surface, upper zones and old channels filled in	areal sediment deposition > 2 cm / year, excessive deposition across entire lake, old channels gone, upstream areas are mud flats
4. Shoreline Stability	good natural shore cover, little evidence of shore erosion	natural cover patchy or poor, some evidence of leeward shore erosion	poor natural shore protection, presence of stabilization structures, rip-rap, soil concrete, etc.	extensive shore erosion or extensive presence of artificial stabilization
5. Shoreline Vegetation	extensive areas of emergent / woody / macrophytic shore vegetation	some areas of emergent / woody / macrophytic shore vegetation	few areas of emergent / woody / macrophytic shore vegetation	no areas of emergent / woody / macrophytic shore vegetation
6. Vegetation above High Water Line	primarily natural vegetation, or re-creation of natural cover of > 18 m width	primarily natural vegetation, or re-creation of natural cover of 12 - 18 m width, minimal human activities replacing natural cover	primarily natural vegetation, or re-creation of natural cover of 6 - 12 m width, mostly human land uses (park, camping, roads, etc.)	primarily natural vegetation, or re-creation of natural cover of < 6 m width, very little good vegetation cover

Form App. D-5

Wetland Use Attainability Analysis Form: Basic Geographic and Hydrological Data Page 1 of 3

Wetland: _____
Date:_____

Location (legal description, etc.):_____

Wetland Surface Area:_____ acres
Watershed Area:_____ acres

Maximum Depth of Primary Pool:_____ meters
Mean Depth of Primary Pool:_____ meters

Fetch Length (longest expanse of open water):_____ meters

Water Level fluctuations are: (Check One)
1 - Mostly Natural _____
2 - In Between 1 and 3 _____
3 - Even Mixture _____
4- In Between 3 and 5 _____
5 - Mostly Artificial _____

Exposure to Prevailing Winds: (Check One)
1 - Fully Protected _____
2 - In Between 1 and 3 _____
3 - Even Mixture _____
4- In Between 3 and 5 _____
5 - Fully Open to Winds _____

Ditches and Channels Present? _____
Inlets and Outlets Present? _____

Underlying Depth to Groundwater: _____ meters

Sheet Versus Channel Inflow: (Check One)
1 - 100% Overland Flow _____
2 - In Between 1 and 3 _____
3 - Even Mixture _____
4- In Between 3 and 5 _____
5 - Near 100% Channel Inflow _____

Potential for Scour and/or Shore Erosion: (Check One)
1 - Low Potential _____
2 - In Between 1 and 3 _____
3 - Even Mixture _____
4- In Between 3 and 5 _____
5 - High Potential _____

Evidence of Human Activity/Impact:

Evidence of Direct Alteration: (List Items and Evidence) _____

Distrubance Sources (things that would disturb bird nesting, etc.): _____
(List Items and Evidence) _____

Population Within Watershed: _____
NPDES Dischargers in Watershed: _____

List Dischargers: _____

Watershed Land Use Composition:

Cropland	_____	acres
Pasture/Grassland	_____	acres
Urban	_____	acres
Animal Confinement	_____	acres
Wooded/Natural/Water	_____	acres
Other _____	_____	acres
Total	_____	acres

Riparian/Shoreline Vegetation: Percent Cover Along Shoreline _____ percent shoreline

Composition of Riparian Vegetation:

Percent Trees/Shrubs	_____	%
Percent Grasses/Forbs	_____	%
Percent Other	_____	%

Predominant Substrate Type: (Check One)

Sand	_____
Silt/Mud	_____
Clay	_____
Cobble	_____

Emergent Plant Zone:

Percent Cover Over Entire Wetland	_____	%
Percent Cover In Primary Pool	_____	%
Dominant Genera	_____	
	_____	
	_____	

Submersed/Floating Leaved Zone:

Percent Cover Over Entire Wetland	_____	%
Percent Cover In Primary Pool	_____	%
Dominant Genera	_____	
	_____	
	_____	

Vegetation/Water Interspersion: (Check One) (Interspersion of Plant Stands and Open Water)

1- Low	_____
2 - In Between 1 and 3	_____
3 - Even Mixture	_____
4- In Between 3 and 5	_____
5 - High	_____

Vegetation Form Richness: (Check One) (Richness of Growth Forms Such As Woody, Broad Leaved, Reed-Like, Etc.)

1- Low	_____
2 - In Between 1 and 3	_____
3 - Even Mixture	_____
4- In Between 3 and 5	_____
5 - High	_____

Physical Habitat Interspersion: (Check One) (Variety of Flow, Depth, and Substrate Interspersion)

- 1- Low _____
- 2 - In Between 1 and 3 _____
- 3 - Even Mixture _____
- 4- In Between 3 and 5 _____
- 5 - High _____

Vegetation Class Interspersion: (Check One) (Interspersion of Various Vegetation Growth Forms)

- 1- Low _____
- 2 - In Between 1 and 3 _____
- 3 - Even Mixture _____
- 4- In Between 3 and 5 _____
- 5 - High _____

Wetland Class (Based on National Wetland Inventory, Cowardin, et al., 1979)

System Classification (Check One):

- Riverine Lower Perennial (within a channel, low gradient, low velocity) _____
- Riverine Upper Perennial (within a channel, higher gradient, higher velocity) _____
- Riverine Intermittent (within a channel, flow is not year-round but may be pooled during low flow) _____
- Lacustrine Limnetic (depressional, <30% plant cover, >20 acres, and >2 meters maximum depth _____
- Lacustrine Littoral (as above, but maximum depth <2 meters) _____
- Palustrine (as above, but <20 acres, <2 meters maximum depth, typically vegetation rich but not required) _____

Class: (Check One Under The Appropriate System Type)

Riverine Systems:
- Rock Bottom _____
- Unconsolidated Bottom _____
- Aquatic Bed _____
- Rocky Shore _____
- Unconsolidated Shore _____
- Emergent Wetland (lower perennial only) _____
- Streambed (intermittent systems only) _____

Lacustrine Systems:
- Rock Bottom _____
- Unconsolidated Bottom _____
- Aquatic Bed _____
- Rocky Shore (littoral only) _____
- Unconsolidated Shore (littoral only) _____
- Emergent Wetland (littoral only) _____

Palustrine Systems:
- Rock Bottom _____
- Unconsolidated Bottom _____
- Aquatic Bed _____
- Unconsolidated Shore _____
- Emergent Wetland _____
- Scrub/Shrub Wetland _____
- Forested Wetland _____

Water Regime Modifiers: (Check One)
- Permanently Flooded _____
- Semipermanently Flooded (all year most years) _____
- Seasonally Flooded (water for extended period, dry by end of year) _____
- Saturated (saturated year-round, but open water rare) _____
- Temporarily Flooded (open water for brief periods in growing season _____
- Intermittently Flooded (substrate usually exposed) _____
- Artificially Flooded (controlled by structures) _____

Average Specific Conductance: _____ umho/cm

Average pH: _____ S.U.

Form App. D-6

FISH COLLECTIONS:

Station _____ Collectors_____

Date _____ Water Temperature_____

Seines Used: _____ ft. Area_____ Electrofishing? ___Yes ___No
_____ ft. Area_____

Fish collection preserved?_____
Identified by:_____

Comments:_____
_____
_____
_____
_____

Species account:

Species	Number Kept	Number Released

PROTOCOL FOR CONDUCTING

USE ATTAINABILITY ANALYSIS (UAA)

FOR

PRIMARY AND SECONDARY CONTACT RECREATION

USE ATTAINABILITY ANALYSIS (UAA)
FOR
PRIMARY AND SECONDARY CONTACT RECREATION

PREPARATION FOR UAA

Review all applicable files, databases and maps in order to become thoroughly familiar with the waterbody to be inspected and to determine what assessment should be accomplished.

The following materials are available from the Kansas Department of Wildlife and Parks (KDWP) and may obviate the need for onsite survey:

_____ fishery resource maps and designations
_____ stream survey maps and collection information
_____ fish collection records from KDWP stream surveys

USE ASSESSMENT PROCEDURES

Classified waters shall be evaluated for recreational uses using the procedures set forth in this section and the criteria for classification set forth in L2001, ch. 100, sec. 1, which describes classified streams as follows:

_____ 1. Classified streams shall include:

_____ A. All streams with a 10-year median flow of equal to or in excess of 1 cubic foot per second (1.0 cfs). Regardless of flow, a stream shall be classified if studies conducted or accepted by the department show that pooling of water during periods of zero flow provides important refuges for aquatic life and permits biological recolonization of intermittently flowing segments and a cost/benefit analysis indicates that the benefits of classifying the stream outweigh the costs of classifying the stream..

_____ B. All streams actually inhabited by threatened or endangered aquatic species listed in rules and regulations promulgated by the Kansas Department of Wildlife and Parks or the U.S. Fish and Wildlife Services.

_____ C. All streams which are at the point of discharge and downstream from such point where the Department has issued a National Pollutant Discharge Elimination System Permit other than a permit for a confined feeding facility.

_____ 2. Classified lakes shall be all lakes owned by federal, state, county or municipal authorities and all privately owned lakes that serve as public drinking water supplies or that are open to the general public for primary or secondary contact recreation. (K.A.R. 28-16-28d)

_____ 3. Classified wetlands shall be all wetlands owned by federal, state, county, or municipal authorities, all privately owned wetlands open to the general public for hunting, trapping or other forms of secondary contact recreation, and all **wetlands** classified as outstanding national resource waters, exceptional state waters, or designated as special aquatic life waters....".(K.A.R. 28-16-28d)

Primary contact recreation shall be considered an existing use in all classified waterbodies known to host one or more of the following activities:

_____ swimming
_____ boating
_____ mussel harvesting
_____ skin diving
_____ waterskiing
_____ windsurfing

or which hosted one or more of these activities on or after November 28, 1975 (based on interviews with streamside landowners or other knowledgeable individuals or other dated documentation).

In order to protect public health, the primary contact recreation use shall be assigned as an attainable use to all waters along: (check applicable conditions)

_____ public parks
_____ public parkways
_____ urban streams

and other waters with a high probability of public access: (check applicable conditions)

_____ boat ramps
_____ camping areas
_____ nature trails
_____ playgrounds

Secondary contact recreation - At a minimum, all classified surface waters shall be designated for this use. It shall be considered an existing use in those waterbodies exhibiting indications of one or more of the following activities:

_____ wading
_____ fishing
_____ trapping
_____ hunting

or which exhibited one or more of these activities on or after November 28, 1975 (based on interviews with streamside landowners or other knowledgeable individuals or other dated documentation).

The secondary contact recreation use shall be considered attainable if:

_____ the waterbody meets the criteria for classification set forth in K.A.R. 28-16-28d(b).

Cost effective best management practices for non-point sources are found in Appendix A.

FIELD ASSESSMENT FOR PRIMARY & SECONDARY CONTACT RECREATION AND FOOD PROCUREMENT

1. Field activities should begin with a visual inspection of the targeted waterbody at several locations. Those stream sites deemed most likely to support primary contact recreation and/or food procurement should be selected for further study. For a lake or wetland, one site may be adequate to characterize existing or potential uses. The number of sites to be assessed on a given waterbody should be determined prior to commencement of field activities. Form E-1 should be used to record findings.

2. Assessment sites should be designated for each UAA and clearly marked on 1:24,000 scale (7.5 minute series) USGS topographic maps (available at: www.topozone.com). If possible, global positioning system (GPS) coordinates

should be taken on-site and recorded on field forms.

3. If access to the waterbody is to be made through private property, landowner or resident permission should be secured prior to access (K.S.A. 21-3721).

4. Narrative UAA site assessments must be clearly recorded, either by electronic or written means, at each assessment site. To reduce the risk of mistakes or confusion regarding existing or attainable uses among multiple sites, it is necessary to record observations before moving to the next assessment site.

   The recorded field assessment must specify the waterbody assessed, legal location, GPS coordinates (if available), field physical data, photographic exposure information, stream width, depth and flow estimations, existing uses actually observed, and any other observations of unusual conditions.

5. A photographic record must be made of sites assessed for the UAA. Photographs should include an upstream view, downstream view, and any photographs required to document observed or potential uses. Photographs must be marked or catalogued in a manner that indicates what is being shown by each photograph.

6. Whenever possible, streamside or other local landowners or residents should be interviewed regarding present or past uses of the waterbody and any social benefits of the waterbody. Persons interviewed should be identified by name and legal address in the recorded field assessment.

FINDINGS OF PRIMARY & SECONDARY CONTACT RECREATION UAA

A written statement of finding and all supporting documentation must be presented to KDHE for review. This statement shall include pertinent findings that support the designation being proposed for adoption in the Kansas Surface Water Quality Standards, K.A.R. 28-16-28d.

Form E-1

FIELD ASSESSMENT WORKSHEET

USE ATTAINABILITY ANALYSIS (UAA)
FOR
PRIMARY & SECONDARY CONTACT RECREATION

Waterbody Name:_____ HUC:_____
Basin: _____ Segment:_____

Location (Legal):_____1/4 _____ 1/4 Sec._____ Township._____ Range_____ Quadrangle _____

Evaluators:_____ Date:_____
Site Location Map or attach photographs:

The evaluator is encouraged to add comments and observations which will aid in making decisions about the site.

1. Direct evidence of:
   Primary contact recreation activities? _____ Yes _____ No
   Secondary contact recreation activities? _____ Yes _____ No

If people are observed recreating in the water, or if direct evidence exists of primary and/or secondary contact recreation, then primary and/or secondary contact recreation are considered existing uses. Types of direct evidence might include rope swings, campfire rings, boat ramps or other constructed or evident points of access.

COMMENTS:_____

2. Sufficient water to support primary contact recreation? _____ Yes _____ No

An average depth of at least 0.5 meter or a maximum depth of at least 1.0 meter at base flow conditions is considered minimal for primary contact recreation. Base flow, as defined in K.A.R. 28-16-28b(f), means that portion of a stream's flow contributed by sources of water other than precipitation runoff. This refers to a fair weather flow sustained primarily by springs or groundwater seepage, wastewater discharges, irrigation return flows, releases from reservoirs, or some combination of these factors.

COMMENTS:_____

3. Economic Considerations:

What activities are apparent along the stream that might impact the water quality of the stream segment, i.e. discharges, crop land, grazing activities, etc.?

STREAM FIELD OBSERVATIONS

Station Description: _____ HUC_____ Seg _____

County:_____ _____ 1/4 _____1/4 Sec _____ T _____ S R _____ E/W

GPS data: (lat) N_____ (long)W_____

Date: _____ Time: _____

Camera Exposure #: Upstream _____ Downstream _____ Other _____

Stream Description:

Upstream View: Physical Dimensions:

☐ riffle width _____ length _____ depth: avg._____ max. _____
☐ run width _____ length _____ depth: avg._____ max. _____
☐ pool width _____ length _____ depth: avg._____ max. _____

Downstream View: Physical Dimensions:

☐ riffle width _____ length _____ depth: avg._____ max. _____
☐ run width _____ length _____ depth: avg._____ max. _____
☐ pool width _____ length _____ depth: avg._____ max. _____

Flow Present? (describe) _____
_____

Predominant Substrate Type: _____

Aquatic Life Observed:

☐ Plants ☐ Frogs ☐ Insects ☐ Fish ☐ Crawfish ☐ Snails

Describe:_____
_____
_____

Stream type: ☐ Perennial (permanent flow) ☐ Intermittent (permanent water)
☐ Ephemeral (seasonal water)

Observations: _____
_____
_____
_____

PROTOCOL FOR CONDUCTING

EXPEDITED

STREAM USE ATTAINABILITY ANALYSIS (UAA)

FOR

PRIMARY AND SECONDARY CONTACT RECREATION

EXPEDITED STREAM
USE ATTAINABILITY ANALYSIS (UAA)
FOR
PRIMARY AND SECONDARY CONTACT RECREATION

PREPARATION FOR UAA

Review all applicable files, databases and maps in order to become thoroughly familiar with the stream to be inspected and to determine what assessment should be accomplished.

Optional Activities:

The following materials are available from Kansas Department of Wildlife and Parks (KDWP) and may obviate the need for onsite survey:

_____ fishery resource maps and designations
_____ stream survey maps and collection information
_____ fish collection records from KDWP stream surveys

CLASSIFICATION ASSESSMENT PROCEDURES:

For all classified streams, recreational uses shall be designated as existing if indications of such uses are evident. These uses shall be designated as attainable if the stream meets the criteria for classification set forth in L2001, ch. 100, sec. 1, which describes classified streams as follows:

_____ A. All streams with a 10-year median flow of equal to or in excess of 1 cubic foot per second (1.0 cfs). Regardless of flow, a stream shall be classified if studies conducted or accepted by the department show that pooling of water during periods of zero flow provides important refuges for aquatic life and permits biological recolonization of intermittently flowing segments and a cost/benefit analysis indicates that the benefits of classifying the stream outweigh the costs of classifying the stream..

_____ B. All streams actually inhabited by threatened or endangered aquatic species listed in rules and regulations promulgated by the Kansas Department of Wildlife and Parks or the U.S. Fish and Wildlife Services.

_____ C. All streams which are at the point of discharge and downstream from such point where the Department has issued a National Pollutant Discharge Elimination System Permit other than a permit for a confined feeding facility.

Period of zero flow: From_____ to _____

Pooling with presence of aquatic life*: _____ Yes _____ No

* In addition to fish, aquatic life includes, but is not limited to, frogs, crayfish, insects, plants and snails.

☐ Stream "NOT Classified", proceed to page 4 to document location of stream assessed (include photographs–be sure the photos are identified with location and an indication of what is being shown by each photograph).

A written statement of finding and all supporting documentation must be presented to KDHE for review. This statement should include pertinent findings that support the designation being proposed for adoption in the Kansas Surface Water Quality Standard, K.A.R. 28-16-28d.

☐ Stream Classified, proceed to pages 2 - 5.

EXPEDITED RECREATIONAL USE ATTAINABILITY ANALYSIS

CLASSIFIED STREAMS

If stream is considered classified on page 1, proceed as outlined below. Check applicable boxes. Primary contact recreation use shall be considered existing in streams in which indications of the following uses are evident:

- ☐ swimming
- ☐ skin diving
- ☐ boating
- ☐ waterskiing
- ☐ mussel harvesting
- ☐ windsurfing
- ☐ none of the above

- ☐ or which were used for this purpose on or after November 28, 1975 (based on interviews with streamside landowners or other knowledgeable individuals or other dated documentation).

In order to protect public health, the primary contact recreation use shall be considered attainable if the stream otherwise meets the criteria for designation set forth in this document. The use will also be assigned to all waters along: (check applicable conditions)

- ☐ public parks
- ☐ public parkways
- ☐ urban streams
- ☐ none of the above

and other waters with a high probability of public access: (check applicable conditions)
boat ramps

- ☐ nature trails
- ☐ camping areas
- ☐ playgrounds
- ☐ none of the above

Secondary contact recreation - At a minimum, all classified streams shall be designated for this use. It shall be considered existing in streams in which indications of the following uses are evident:

- ☐ wading
- ☐ trapping
- ☐ fishing
- ☐ hunting
- ☐ none of the above
- ☐ or which were used for this purpose on or after November 28, 1975 (based on interviews with streamside landowners or other knowledgeable individuals or other dated documentation).

The secondary contact recreation use shall be considered attainable if:

- ☐ the stream meets the criteria for classification set forth in K.A.R. 28-16-28d(b), (See page 23).

Cost effective best management practices for non-point sources are found in Appendix A.

FIELD ASSESSMENT FOR PRIMARY CONTACT RECREATION

A. Field activities should begin with a visual inspection of the targeted stream at several locations. For most stream segments, a minimum of three (3) stream sites deemed most likely to support primary contact recreation should be selected for further study. Form E-1 should be used to record findings.

B. Assessment sites should be designated for each UAA and clearly marked on 1:24,000 (7.5 minute series) USGS topographic maps or topographic maps available at: www.topozone.com with a 1:25,000 resolution. When possible, GPS (global positioning system) coordinates should be taken on-site and recorded on field forms.

C. If access to the stream is to be made on private property, landowner or resident permission should be secured prior to access (K.S.A. 21-3721).

D. Clearly record findings at each assessment site. The written findings must include the stream assessed, legal location, GPS coordinates if available, stream width and depth, flow estimations, existing uses actually observed, and any other observations of unusual conditions.

E. A photographic record must be made of sites assessed for the UAA. Photographs should include an upstream view, downstream view, and any photographs required to document observed or potential uses. Photographs should be documented to indicate what is being shown by the photograph.

F. Whenever possible, streamside or other local landowners or residents should be interviewed regarding present or past uses of the stream and any social benefits of the waterbody. Persons interviewed should be identified by name and legal address in the written assessment.

FINDINGS OF PRIMARY CONTACT RECREATION UAA:

A written statement of finding and all supporting documentation must be presented to KDHE for review. This statement should include pertinent findings that support the designation being proposed for adoption in the Kansas Surface Water Quality Standard, K.A.R. 28-16-28d.

Form E-1

USE ATTAINABILITY ANALYSIS (UAA)
FOR
PRIMARY AND SECONDARY CONTACT RECREATION

Stream or Lake Name:_____ HUC:_____
Basin: _____ Segment:_____

Location (Legal):____1/4 ____ 1/4 Sec.____ Township.____ Range____ Quadrangle _____

Evaluators:_____ Date:_____
Site Location Map or attach photographs:

The evaluator is encouraged to add comments and observations which will aid in making decisions about the site.

1. Direct evidence of:
   Primary contact recreation activities? _____ Yes _____ No
   Secondary contact recreation activities? _____ Yes _____ No

If people are observed recreating in the water, or if direct evidence exists of primary and/or secondary contact recreation, then primary and/or secondary contact recreation are considered existing uses. Types of direct evidence might include rope swings, campfire rings, boat ramps or other constructed or evident points of access.

COMMENTS:_____

2. Sufficient water to support primary contact recreation? _____ Yes _____ No

An average depth of at least 0.5 meter or a maximum depth of at least 1.0 meter at base flow conditions is considered minimal for primary contact recreation. Base flow, as defined in K.A.R. 28-16-28b(f), means that portion of a stream's flow contributed by sources of water other than precipitation runoff. This refers to a fair weather flow sustained primarily by springs or groundwater seepage, wastewater discharges, irrigation return flows, releases from reservoirs, or some combination of these factors.

COMMENTS:_____

3. Economic Considerations:

What activities are apparent along the stream that might impact the water quality of the stream segment, i.e. discharges, cropland, grazing activities, etc.?

STREAM FIELD OBSERVATIONS

Station Description: _____ HUC_____ Seg _____

County:_____ _____ 1/4 _____1/4 Sec _____ T _____ S R _____ E/W

GPS data: (lat) N_____ (long)W_____

Date: _____ Time: _____

Camera Exposure #: Upstream _____ Downstream _____ Other _____

Stream Description:

Upstream View: Physical Dimensions:

☐ riffle width _____ length _____ depth: avg._____ max. _____
☐ run width _____ length _____ depth: avg._____ max. _____
☐ pool width _____ length _____ depth: avg._____ max. _____

Downstream View: Physical Dimensions:

☐ riffle width _____ length _____ depth: avg._____ max. _____
☐ run width _____ length _____ depth: avg._____ max. _____
☐ pool width _____ length _____ depth: avg._____ max. _____

Flow Present? (describe) _____
_____

Predominant Substrate Type: _____

Aquatic Life Observed:

☐ Plants ☐ Frogs ☐ Insects ☐ Fish ☐ Crawfish ☐ Snails

Describe:_____
_____
_____

Stream type: ☐ Perennial (permanent flow) ☐ Intermittent (permanent water)
☐ Ephemeral (seasonal water)

Observations: _____
_____
_____
_____

PROTOCOL FOR CONDUCTING

USE ATTAINABILITY ANALYSIS (UAA)

FOR

FOOD PROCUREMENT

USE ATTAINABILITY ANALYSIS (UAA)
FOR
FOOD PROCUREMENT

PREPARATION FOR UAA

Review all applicable files, databases and maps in order to become thoroughly familiar with the waterbody to be inspected and to determine what assessment should be accomplished.

The following materials are available from the Kansas Department of Wildlife and Parks (KDWP) and may obviate the need for onsite survey:
_____ fishery resource maps and designations
_____ stream survey maps and collection information
_____ fish collection records from KDWP stream surveys

USE ASSESSMENT PROCEDURES

Classified waters shall be evaluated for recreational uses using the procedures set forth in this section and the criteria for classification set forth in L2001, ch. 100, sec. 1, which describes classified streams as follows:

_____ 1. Classified streams shall include:
_____ A. All streams with a 10-year median flow of equal to or in excess of 1 cubic foot per second (1.0 cfs). Regardless of flow, a stream shall be classified if studies conducted or accepted by the department show that pooling of water during periods of zero flow provides important refuges for aquatic life and permits biological recolonization of intermittently flowing segments and a cost/benefit analysis indicates that the benefits of classifying the stream outweigh the costs of classifying the stream..
_____ B. All streams actually inhabited by threatened or endangered aquatic species listed in rules and regulations promulgated by the Kansas Department of Wildlife and Parks or the U.S. Fish and Wildlife Services.
_____ C. All streams which are at the point of discharge and downstream from such point where the Department has issued a National Pollutant Discharge Elimination System Permit other than a permit for a confined feeding facility.

_____ 2. Classified lakes shall be all lakes owned by federal, state, county or municipal authorities and all privately owned lakes that serve as public drinking water supplies or that are open to the general public for primary or secondary contact recreation. (K.A.R. 28-16-28d)

_____ 3. Classified wetlands shall be all wetlands owned by federal, state, county, or municipal authorities, all privately owned wetlands open to the general public for hunting, trapping or other forms of secondary contact recreation, and all wetlands classified as outstanding national resource waters, exceptional state waters, or designated as special aquatic life waters....". (K.A.R. 28-16-28d)

Food procurement - For waterbodies designated for aquatic life support use, the food procurement

use shall be considered existing in waterbodies in which there is visual or recorded (e.g., KDWP creel census or fishery survey) evidence of the following activities:

_____ fishing
_____ consumption of turtles, bullfrogs, crayfish, mussels or aquatic macrophytes
_____ waterfowl hunting activities

or which hosted these activities on or after November 28, 1975 (based on interviews with streamside landowners or other knowledgeable individuals or other dated documentation).

Food procurement use shall be considered attainable if:

_____ the waterbody is found to support waterfowl, gamefish or other large fish, panfish, or other edible and legally harvestable aquatic or semiaquatic species.

Cost effective best management practices for non-point sources are found in Appendix A.

FINDINGS OF FOOD PROCUREMENT UAA

A written statement of finding and all supporting documentation must be presented to KDHE for review. This statement shall include pertinent findings that support the designation being proposed for adoption in the Kansas Surface Water Quality Standards, K.A.R. 28-16-28d.

Form E-1

FIELD ASSESSMENT WORKSHEET

USE ATTAINABILITY ANALYSIS (UAA)
FOR
FOOD PROCUREMENT

Waterbody Name:_____ HUC:_____
Basin: _____ Segment:_____

Location (Legal):____1/4 ____ 1/4 Sec.____ Township.____ Range____ Quadrangle _____

Evaluators:_____ Date:_____
Site Location Map or attach photographs:

The evaluator is encouraged to add comments and observations which will aid in making decisions about the site.

1. Direct evidence of:

Food procurement activities? _____ Yes _____ No

For food procurement designation, note any evidence of fishing activities such as fishing lines, bait cans, etc. Indicate findings regarding food procurement in comment section.

COMMENTS:_____

2. Economic Considerations:

What activities are apparent along the stream that might impact the water quality of the stream segment, i.e. discharges, crop land, grazing activities, etc.?

STREAM FIELD OBSERVATIONS

Station Description: _____ HUC_____ Seg _____

County:_____ _____ 1/4 _____1/4 Sec _____ T _____ S R _____ E/W

GPS data: (lat) N_____ (long)W_____

Date: _____ Time: _____

Camera Exposure #: Upstream _____ Downstream _____ Other _____

Stream Description:

Upstream View: Physical Dimensions:

☐ riffle width _____ length _____ depth: avg._____ max. _____
☐ run width _____ length _____ depth: avg._____ max. _____
☐ pool width _____ length _____ depth: avg._____ max. _____

Downstream View: Physical Dimensions:

☐ riffle width _____ length _____ depth: avg._____ max. _____
☐ run width _____ length _____ depth: avg._____ max. _____
☐ pool width _____ length _____ depth: avg._____ max. _____

Flow Present? (describe) _____
_____

Predominant Substrate Type: _____

Aquatic Life Observed:

☐ Plants ☐ Frogs ☐ Insects ☐ Fish ☐ Crawfish ☐ Snails

Describe:_____
_____
_____

Stream type: ☐ Perennial (permanent flow) ☐ Intermittent (permanent water)
☐ Ephemeral (seasonal water)

Observations: _____
_____
_____
_____

PROTOCOL FOR CONDUCTING

USE ATTAINABILITY ANALYSIS (UAA)

FOR

WATER SUPPLY USES

USE ATTAINABILITY ANALYSIS (UAA)
FOR
WATER SUPPLY USES

DEFINITIONS

Agricultural water supply is the provision of water for **irrigation or livestock watering**. Irrigation is the withdrawal of surface water for application onto land. Livestock watering is the provision of water to livestock for consumption. Waterbodies in direct contact with alluvial aquifers may be assigned the agricultural water supply use if the alluvial aquifer is utilized for livestock watering or irrigation.

Domestic water supply is the use of surface water, after appropriate treatment, for the production of potable water. Waterbodies in direct contact with alluvial aquifers may be assigned the domestic water supply use if the alluvial aquifer is utilized for potable water.

Industrial water supply uses include cooling water, hydroelectric power generation, or nonfood processing water for commercial or industrial activities. Waterbodies in direct contact with alluvial aquifers may be assigned the industrial water supply use if the aquifer is utilized for the purpose.

Groundwater recharge use is assigned to surface waters that replenish fresh or usable groundwater aquifers. The use involves infiltration, percolation or direct injection of surface waters into underground aquifers.

PREPARATION FOR UAA

Review all applicable files, databases and maps in order to become thoroughly familiar with the waterbody to be inspected and to determine what sampling will be accomplished. Indicate which resources have been reviewed and/or condition satisfied.

X = resource checked or condition satisfied
O = resource not available or condition not satisfied

The WIMAS (Water Information Management and Analysis System) GIS (Geographic Information System) database shall be consulted to determine the existence of surface or alluvial aquifer groundwater appropriations for the purpose of:

_____ irrigation use (agricultural water supply)
_____ livestock watering use (agricultural water supply)
_____ production of potable water (domestic water supply use)
_____ industrial water supply
_____ aquifer replenishment (groundwater recharge)

Kansas Department of Health and Environment (KDHE), Bureau of Water (BOW) feedlot records shall be consulted to determine the existence of:

_____ concentrated animal facilities which might have access to the waterbody for obtaining

drinking water (agricultural water supply)

Public Water Supply Section (KDHE, BOW) records shall be reviewed to determine the existence of surface or alluvial aquifer groundwater appropriations for the purpose of:
_____ production of potable water (domestic water supply use)
_____ aquifer replenishment (groundwater recharge)

United States Geological Survey (USGS) topographic maps and aerial photographs (if available) shall be reviewed for the presence of:
_____ likely areas of small feedlots not required to hold permits (agricultural water supply)
_____ winter feeding operations (agricultural water supply)
_____ other likely points of livestock access to the waterbody (agricultural water supply)

For the groundwater recharge use, available geological (USGS, Kansas Geological Survey) information shall also be reviewed to determine:
_____ presence or absence of alluvial aquifers, seeps or springs in or near the waterbody, and
_____ whether the waterbody is characterized as a "gaining" or "losing" stream

DOCUMENTATION OF LITERATURE/DATABASE SEARCH

A written summary must identify pertinent findings and source of information.

USE ASSESSMENT PROCEDURES

Assessment sites shall be designated for each UAA and clearly marked on 1:24,000 scale (7.5 minute series) USGS topographic maps (available at: www.topozone.com).

Irrigation - Waterbodies:
_____ currently used for the withdrawal of surface water for application onto land, or
_____ which were used for this purpose on or after November 28, 1975,
shall be considered to have irrigation as an existing use. This information is obtained from water rights appropriations filed with the Kansas Division of Water Resources (DWR), onsite visual observation, or interviews with stream side landowners or other knowledgeable individuals.

1. The "domestic use" provision of the Kansas Water Appropriation Act (K.S.A. 82a-701(c), K.S.A. 82a-705, K.S.A. 82a-705a) effectively makes all waters of the state available for household purposes, livestock and domestic animal watering, and irrigation of up to two acres without the need for a formal appropriation right. This provision applies to both surface and groundwater statewide (there are no "closed" waters) subject only to the provisions that the use does not conflict with senior water rights or result in complete cessation of flow in surface streams. Consequently, all classified waterbodies for which available chemical water quality data indicate naturally occurring levels of fluoride averaging less than two times the irrigation criterion, shall be considered to have irrigation as an attainable use.

Surface Water Quality Data (mean)			Irrigation Criterion (x2)		
Fluoride	_____	mg/L	Fluoride	2	mg/L

Note: These data may be available from KDHE's Bureau of Environmental Field Services or may be obtained independently by the evaluator. If the latter alternative is chosen, all water samples must be analyzed by a laboratory certified by KDHE to conduct fluoride analyses (K.S.A.65-171*l*). Sample collection and analysis shall be accomplished following standard methods described in *Standard Methods for the Examination of Water and Wastewater, 17th Ed.*, 1989 (or later edition), Washington DC: American Public Health Association.

2. Waterbodies in direct contact with alluvial aquifers shall be assigned irrigation as an existing use if:
   _____ the aquifer is used as an irrigation source, or was used for this purpose on or after November 28, 1975 (based on information obtained from water rights appropriations filed with DWR, onsite visual observation, or interviews with stream side landowners or other knowledgeable individuals).

3. Because of the "domestic use" provision of the Kansas Water Appropriation Act (as explained above), waterbodies in direct contact with alluvial aquifers for which available chemical water quality data indicate naturally occurring levels of fluoride averaging less than two times the irrigation criterion, shall be considered to have irrigation as an attainable use.

Aquifer Water Quality Data (mean)			Irrigation Criterion (x2)		
Fluoride	_____	mg/L	Fluoride	2	mg/L

Note: These data may be available from KDHE's Bureau of Environmental Field Services or may be obtained independently by the evaluator. If the latter alternative is chosen, all water samples must be analyzed by a laboratory certified by KDHE to conduct fluoride analyses (K.S.A 65-171*l*). Sample collection and analysis shall be accomplished following standard methods described in *Standard Methods for the Examination of Water and Wastewater, 17th Ed.*, 1989 (or later edition), Washington DC: American Public Health Association.

Livestock Watering - The livestock watering use shall be considered existing when:
_____ indications of such use are evident, or
_____ the waterbody was used for this purpose on or after November 28, 1975 (based on information obtained from water rights appropriations filed with DWR, onsite visual observation, or interviews with streamside landowners or other knowledgeable individuals).

1. Because of the "domestic use" provision of the Kansas Water Appropriation Act (as explained above), livestock watering shall be considered an attainable use if available chemical water quality data indicate naturally occurring levels of sulfate and fluoride averaging less than two times the livestock watering criteria and the waterbody meets the criteria for classification set forth in L2001, ch. 100, sec. 1, which describes classified streams as follows:

_____ 1. Classified streams shall include:

_____ A. All streams with a 10-year median flow of equal to or in excess of 1 cubic foot per second (1.0 cfs). Regardless of flow, a stream shall be classified if studies conducted or accepted by the department show that pooling of water during periods of zero flow provides important refuges for aquatic life and permits biological recolonization of intermittently flowing segments and a cost/benefit analysis indicates that the benefits of classifying the stream outweigh the costs of classifying the stream..

_____ B. All streams actually inhabited by threatened or endangered aquatic species listed in rules and regulations promulgated by the Kansas Department of Wildlife and Parks or the U.S. Fish and Wildlife Services.

_____ C. All streams which are at the point of discharge and downstream from such point where the Department has issued a National Pollutant Discharge Elimination System Permit other than a permit for a confined feeding facility.

_____ 2. Classified lakes shall be all lakes owned by federal, state, county or municipal authorities and all privately owned lakes that serve as public drinking water supplies or that are open to the general public for primary or secondary contact recreation. (K.A.R. 28-16-28d)

_____ 3. Classified wetlands shall be all wetlands owned by federal, state, county, or municipal authorities, all privately owned wetlands open to the general public for hunting, trapping or other forms of secondary contact recreation, and all wetlands classified as outstanding national resource waters, exceptional state waters, or designated as special aquatic life use waters....". (K.A.R. 28-16-28d)

Surface Water Quality Data (mean)			Livestock Watering Criterion (x2)		
Sulfate	_____	mg/L	Sulfate	2,000	mg/L
Fluoride	_____	mg/L	Fluoride	4	mg/L

Note: These data may be available from KDHE's Bureau of Environmental Field Services or may be obtained independently by the evaluator. If the latter alternative is chosen, all water samples must be analyzed by a laboratory certified by KDHE to conduct sulfate and fluoride analyses (K.S.A. 65-171*l*). Sample collection and analysis shall be accomplished following standard methods described in *Standard Methods for the Examination of Water and Wastewater, 17th Ed.*, 1989 (or later edition), Washington DC: American Public Health Association.

2. Classified waterbodies in direct contact with alluvial aquifers shall be assigned livestock watering as an existing use if the aquifer is:

_____ used as a livestock watering source, or

_____ was used for this purpose on or after November 28, 1975 (based on information obtained from water rights appropriations filed with DWR, onsite visual observation, or interviews with streamside landowners or other knowledgeable individuals).

3. Because of the "domestic use" provision of the Kansas Water Appropriation Act (as explained above), classified waterbodies in direct contact with alluvial aquifers for which available chemical water quality data indicate naturally occurring levels of sulfate and fluoride averaging less than two times the livestock watering criteria, shall be considered to have livestock watering as an attainable use.

Aquifer Water Quality Data (mean)			Livestock Watering Criterion (x2)		
Sulfate	_____	mg/L	Sulfate	2,000	mg/L
Fluoride	_____	mg/L	Fluoride	4	mg/L

Note: These data may be available from KDHE's Bureau of Environmental Field Services or may be obtained independently by the evaluator. If the latter alternative is chosen, all water samples must be analyzed by a laboratory certified by KDHE to conduct sulfate and fluoride analyses (K.S.A.65-171*l*). Sample collection and analysis shall be accomplished following standard methods described in *Standard Methods for the Examination of Water and Wastewater, 17th Ed.*, 1989 (or later edition), Washington DC: American Public Health Association.

Domestic Water Supply - Waterbodies:

_____ currently used as a direct source of domestic water supply, or

_____ which were used for this purpose on or after November 28, 1975 (based on information obtained from KDHE's Public Water Supply Section, water rights appropriations filed with DWR, onsite visual confirmation, or interviews with streamside landowners or other knowledgeable individuals) shall be designated as having an existing domestic water supply use.

1. Because of the "domestic use" provision of the Kansas Water Appropriation Act (as explained above), waterbodies for which available chemical water quality data indicate naturally occurring levels of sulfate, chloride and fluoride averaging less than two times the domestic water supply criteria, shall be considered to have domestic water supply as an attainable use.

Surface Water Quality Data (mean)			Domestic Water Supply Criterion (x2)		
Sulfate	_____	mg/L	Sulfate	500	mg/L
Chloride	_____	mg/L	Chloride	500	mg/L
Fluoride	_____	mg/L	Fluoride	4	mg/L

Note: These data may be available from KDHE's, Bureau of Environmental Field Services, or may be obtained independently by the evaluator. If the latter alternative is chosen, all water samples must be analyzed by a laboratory certified by KDHE to conduct sulfate, chloride and fluoride analyses (K.S.A.65-171*l*). Sample collection and analysis shall be accomplished following standard methods described in *Standard Methods for the Examination of Water and Wastewater, 17th Ed.*, 1989 (or later edition), Washington DC: American Public Health Association

2. Waterbodies in direct contact with alluvial aquifers shall be assigned domestic water supply as an existing use if the aquifer:
   _____ is used as a domestic water supply source, or
   _____ was used for this purpose on or after November 28, 1975, (based on information obtained from KDHE Bureau of Water, Public Water Supply Section, water rights appropriations filed with DWR, onsite visual observation, or interviews with streamside landowners or other knowledgeable individuals).

3. Because of the "domestic use" provision of the Kansas Water Appropriation Act (as explained above), waterbodies in direct contact with alluvial aquifers for which available chemical water quality data indicate naturally occurring levels of sulfate, chloride and fluoride averaging less than two times the domestic water supply criteria, shall be considered to have domestic water supply as an attainable use.

Aquifer Water Quality Data (mean)			Domestic Water Supply Criterion (x2)		
Sulfate	_____	mg/L	Sulfate	500	mg/L
Chloride	_____	mg/L	Chloride	500	mg/L
Fluoride	_____	mg/L	Fluoride	4	mg/L

Note: These data may be available from KDHE's Bureau of Environmental Field Services or may be obtained independently by the evaluator. If the latter alternative is chosen, all water samples must be analyzed by a laboratory certified by KDHE to conduct sulfate, chloride and fluoride analyses (K.S.A.65-171*l*). Sample collection and analysis shall be accomplished following standard methods described in *Standard Methods for the Examination of Water and Wastewater, 17th Ed.*, 1989 (or later edition), Washington DC: American Public Health Association.

Industrial Water Supply - Waterbodies where existing uses include:
_____ cooling water,
_____ hydroelectric power generation, or
_____ non-food processing water for commercial or industrial activities,
or which were used for this purpose on or after November 28, 1975 shall be assigned industrial water supply as an existing use. This information is obtained from water rights appropriations filed with DWR or from onsite visual confirmation.

1. Classified waterbodies not currently used for the purpose of industrial water supply, but which:
   _____ would be considered for appropriation for this purpose by DWR,
   shall be considered to have industrial water supply as an attainable use.

2. Waterbodies in direct contact with alluvial aquifers shall be assigned industrial water supply as an existing use if the aquifer:
   _____ is used as an industrial water supply source, or
   _____ was used for this purpose on or after November 28, 1975 (based on information obtained from water rights appropriations filed with DWR or onsite visual observation).

3. Classified surface waters in contact with alluvial aquifers not currently used for this purpose, but which:
_____ would be considered for appropriation for this purpose by DWR,
shall be considered to have industrial water supply as an attainable use.

Groundwater Recharge - The groundwater recharge use shall be considered existing when:
_____ sand,
_____ gravel,
_____ fractured bedrock, or
_____ other unconsolidated substrates are present, or
_____ when springs or seeps occur in or near the streambed, or
_____ if the waterbody is characterized a "losing" stream based on information obtained from KGS, USGS, or onsite visual observation, or
_____ the waterbody is utilized for injection for aquifer replenishment.

FIELD ASSESSMENT FOR WATER SUPPLY USES

Because of water appropriation and other available information, field assessments are usually not needed to determine the water supply use designation. However, in the event a field assessment for water supply uses is needed, the length of the stream segment should be observed for the presence of livestock access, surface diversions, or wells constructed within the alluvial aquifer zone. It may be necessary to interview landowners or tenants along the stream segment to determine any water supply uses made of the surface water or alluvial aquifer.

FINDINGS OF WATER SUPPLY USE

A written statement of finding and all supporting documentation must be presented to KDHE for review
This statement should include all pertinent findings that support the designation being proposed for adoption in the Kansas Surface Water Quality Standards, (K.A.R. 28-16-28d).

APPENDIX A

COST-EFFECTIVE BEST MANAGEMENT PRACTICES
FOR
NON-POINT SOURCES

Extracted from Appendix I
Kansas Non-point Source Management Plan
2000 Update

Table I - 2 Kansas Water Quality Protection Measures for Nonpoint Pollutant Sources

ID	Source & Pollutant	Water Quality Protection Expectation	Authority and/or Guidance
ID: See Table I-1		**R:Recommended water quality protection measure M:Mandatory water quality protection measure, based on federal, state, or local rule or regulation**	
	Nonpoint Pollutant Sources	**<u>Definition</u>**: Any pollutant sources not required to have a National Pollutant Discharge Elimination System (NPDES) permit.	K.A.R. 28-16-28b(kk)
		Discharges from nonpoint pollutant sources shall not cause a violation of Kansas Water Quality Standards	K.A.R 28-16-28b-f
		All Kansas water resources are assumed to be threatened by nonpoint pollutant sources unless all nonpoint pollutant sources are using the minimum recommended water quality protection - water pollution control measures described herein. On a voluntary basis, landowners should utilize applicable best management practices (BMPs) to minimize storm water runoff from various land use activities including: domestic lawn care, agriculture, industrial use, and construction.	
		Take advantage of, and maintain, all existing and naturally occurring features of the watershed including permanently vegetated riparian areas, wetlands and ponds which contribute to the protection of water quality. Maintain and restore existing hydrology and streambed geomorphology.	***Local Planning Guide for Wetland and Riparian Areas in Kansas,*** Kansas Water Office, 1993 ***Kansas Forest Stewardship Plan 2000-2005***, Kansas Forest Service, February 14, 2001.
40,	Business,	**R:** Develop and implement water quality protection plan pursuant to	***Kansas Local Government Water -***

Table I - 2 Kansas Water Quality Protection Measures for Nonpoint Pollutant Sources

ID	Source & Pollutant	Water Quality Protection Expectation	Authority and/or Guidance
ID: See Table I-1		**R:Recommended water quality protection measure M:Mandatory water quality protection measure, based on federal, state, or local rule or regulation**	
45, 47	Commercial, Industrial and Institutional Sites	guidelines set out by Kansas Nonpoint Source Pollution Control Principles and Practices **M:** 11 industrial categories subject to NPDES permit requirements	***Quality Planning Guide***, K-State Research and Extension, November, 1999. ***Storm Waer Managment for Industrial Activities*** EPA 832-R-92-006, September, 1992
10	Agricultural Land in General	**R:** Apply resource management systems which provide for sustainable use and sound management of soil, air, plant and animal resources. .	***NRCS Field Office Technical Guide***, Natural Resources Conservation Service
11, 12,	Cropland	R: Use residue preserving tillage, practice crop rotation, use contour tillage and terraces, maintain buffers along field edges and streams, use nutrient management plans to limit nutrient runoff and leaching.	***Kansas Catalog of Nonpoint Source Pollution Control Practices: Agricultural Land*** K-State Research and Extension, MS-8-95, August, 1995
14, 15	Range/Pasture Land	R: Develop and follow a grazing management plan designed to provide sustained forage production, avoid overgrazing, practice management intensive grazing, manage livestock watering points to minimize water quality impacts.	***Managing Kansas Grazinglands for Water Quality***, K-State Research and Extension, MF-2086, March, 1995

Table I - 2 Kansas Water Quality Protection Measures for Nonpoint Pollutant Sources

ID	Source & Pollutant	Water Quality Protection Expectation	Authority and/or Guidance
ID: See Table I-1		**R:Recommended water quality protection measure M:Mandatory water quality protection measure, based on federal, state, or local rule or regulation**	
70	Riparian	**R:** Riparian areas should have a permanently vegetated buffer of grass or trees at least 66 feet wide.	***Wetland and Riparian Areas Program Best Management Practices for Kansas***, KSU Extension Forestry, KDWP, 1995 ***Kansas River and Stream Corridor Management Guide*** Kansas State Conservation Commission
	Wheat	**R:** Crop Rotation, Match Inputs to Growth Stage & Yield Goal, Promote Root Health, Break the Green Bridge, Use Certified Seed	***Best Management Practices for Wheat***, National Association of Wheat Growers Foundation, 1995
	Total Suspended Solids	**R:** Apply measures to reduce soil erosion losses from the field. Uplands - annual erosion rate does not exceed tolerable soil erosion rate. Bottom land - annual erosion does not exceed tolerable erosion rate and runoff is discharged through edge of field buffer strip or filter, healthy riparian area, detention basin or wetland.	***Kansas No-till Handbook***, K-State Research & Extension, S-126, November, 1999
	Nitrogen	See ***Nutrient Application***	
	Pesticides	**M:** Apply pesticides according to directions on the product label. **R:** Where feasible avoid or reduce use, band herbicides at planting or cultivation, use integrated pest management strategies, incorporate	K.S.A 2-2438 and 2-2472, ***Managing to Minimize Atrazine Runoff*** - K-State Research & Extension, MF 2208,

Table I - 2 Kansas Water Quality Protection Measures for Nonpoint Pollutant Sources

ID	Source & Pollutant	Water Quality Protection Expectation	Authority and/or Guidance
ID: See Table I-1		**R:Recommended water quality protection measure** **M:Mandatory water quality protection measure, based on federal, state, or local rule or regulation**	
		when feasible, maintain or establish vegetative edge of field buffer areas and practice soil conservation. For transportation and storage recommendations, See ***Nutrient Application, Transportation, & Storage.***	February, 2000. ***Kansas Grower's Guide to Best Management Practices***, Kansas Corn Growers Association, January, 2000
	Phosphorous	See ***Cropland Total Suspended Solids and Nutrient Application***	
19.1	Farmsteads	**R:** All farmsteads should develop and implement a water quality protection plan using the principles set out by Kansas Farm*A*Syst. **M:** House hold wastewater , see **On-site Wastewater**	***Kansas Farm*A*Syst*** KSU Cooperative Extension, 2000
	Homesites, rural non-farm	**R:** All homesites (rural and urban) develop and implement a water quality protection plan based on the principles set out by Kansas Home*A*Syst. **M:** Household wastewater , see **On-site Wastewater**	***Kansas Home*A*Syst*** KSU Cooperative Extension, 1999
Hydrologic Modification			
71, 72, 73	Channel modification & filling	**M:** Comply with terms and conditions of permits issued by US Army Corps of Engineers and KS Dept of Agriculture- Division of Water Resources and water quality certification issued by KS Dept of Health and Environment. **R**: Maintain or restore stream hydrology in land use planning.	US Army Corps of Engineers, CWA Section 401, CWA Section 404 KS Dept of Ag - DWR; KSA 82a 301-305a KDHE; KAR 28-16-28f(c)(1) ***Kansas Water Quality Practices: Guidelines for Preparing a Project Water Quality Protection Plan*** KDHE,

Table I - 2 Kansas Water Quality Protection Measures for Nonpoint Pollutant Sources

ID	Source & Pollutant	Water Quality Protection Expectation	Authority and/or Guidance
ID: See Table I-1		**R:Recommended water quality protection measure M:Mandatory water quality protection measure, based on federal, state, or local rule or regulation**	
			June, 2000
Construction Sites			
30, 31, 32	Construction Activities greater than 5 acres	**M:** Have NPDES permit and storm water pollution prevention plan approved by KDHE. Install soil erosion and sediment control measures prior to construction and maintain through the life of the project.	KDHE Bureau of Water, Industrial Programs, KAR 28-16 ***Storm Water Managment for Construction Activites***, EPA 832-R-92-005, September 1992
30, 31, 32	Construction activities less than 5 acres	**R:** Develop and implement a nonpoint source construction site water quality protection plan developed pursuant to Kansas Nonpoint Source Pollution Control Principles and Practices. KDHE is currently accepting Notices of Intent (NOI) for construction activities on sites greater than 1 acre.	Until EPA phase II stormwater rules are promulgated after which construction sites one acre and greater must have NDPES permit.
Livestock Production and Animal Keeping			
16	Confined feeding	**M:** All confined feeding livestock production shall be managed so that the facility does not have a significant pollution potential. T Any facility confining more than 300 animal units shall register with KDHE. Upon registration, KDHE determines if	KSA 65-171d KAR 28-18-1

Table I - 2 Kansas Water Quality Protection Measures for Nonpoint Pollutant Sources

ID	Source & Pollutant	Water Quality Protection Expectation	Authority and/or Guidance
ID: See Table I-1		**R:Recommended water quality protection measure M:Mandatory water quality protection measure, based on federal, state, or local rule or regulation**	
		facility has significant pollution potential. T Any livestock production enterprise using designed water pollution control structures must have KDHE water pollution control permit and may require an NPDES permit. T Facilities confining 1,000 and more animal units shall have NPDES permit.	
	Dog Farms	**M/R**: If determined to have significant pollution potential, comply with provisions of KDHE rules and regulations. Otherwise develop and follow a water quality protection plan designed to minimize discharge of pollutants to waters of the state.	Sand Springs Aquifer Protection Project, Dickinson County is working with National Grey Hound Association to develop water quality protection guidelines.
Nutrient Application, Transport & Storage			
	Application	**R:** Apply nutrients, including animal manures and wastewater treatment biosolids at rates designed to meet actual crop needs	KSU Cooperative Extension

Table I - 2 Kansas Water Quality Protection Measures for Nonpoint Pollutant Sources

ID	Source & Pollutant	Water Quality Protection Expectation	Authority and/or Guidance
ID: See Table I-1		**R:Recommended water quality protection measure M:Mandatory water quality protection measure, based on federal, state, or local rule or regulation**	
		necessary to achieve yield goals based on 10 percent more than the 5 year average yield. 2. Calibrate application equipment at least annually 3. Practice annual soil testing, determine yield variations with individual fields and apply nutrients accordingly. 4. Minimize use of broadcast application. 5. Determine and maintain nutrient budgets.	
	Transport	**M:** Immediately report all spills to the KDHE Spills Hotline at (785) 296-1679.	KSA 65-171d KAR 28-16-27
		R: Minimize chances of spills occurring during transportation. 6. Maintain transportation equipment (especially tires) to minimize equipment failure. 7. Store equipment in secure location to avoid vandalism. 8. Drive defensively 9. Avoid water supply protection areas wherever possible 10. Know the location of water supply diversion points and phone number of contacts.	
	Storage, noncommercial	**R:** Follow Kansas Department of Agriculture rules and regulations for commercial sites.	

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		18. Store chemicals in a secure location, at least 100 feet from a well or flood plain. 19. Develop and maintain a spill containment and recovery plan. 20. Keep accurate records of chemical and quantities stored.	
47.01	Commercial Storage, Mixing - Blending and Distribution Sites	**M:** Comply with rules and regulations of the Kansas Department of Agriculture (KDA) adopted pursuant to KSA 2-1227. KDA is authorized to adopt rules and regulations for the safe handing and storage of commercial fertilizers; establishment of minimum standards covering design, construction, location, installation and operation and prevention of discharge of fertilizer materials in to ground or surface waters of the state, contaiment of spills and promt recovery of spilled materials.	KSA 2-1226 KAR 4-4-900 to 984
	On-site Wastewater	**M:** All on-site wastewater treatment systems (septic tank/lateral fields, lagoons) shall be designed and operated to assure no-discharge to the surface and groundwater quality is maintained.	KAR 28-5-6; KDHE Bulletin 4-2; March 1997 - ***Minimum Standards of Design and Construction of On-site Wastewater Systems*** and applicable local codes in 100 counties.
	Domestic Pet Waste	**R**: Collect and dispose of pet waste to prevent contamination of storm water runoff.	
40	Urban Land	**M**: Apply pesticides to lawns, gardens, ornamental plants and buildings according to directions on product labels. **R:** Conduct soil tests to determine amount of lawn fertilizers to be applied. Limit impervious areas in new and existing developments.	***Stormwater Strategies - Community Responses to Runoff Pollution***, Natural Resources Defense Council, May, 1999. ***Building Clane Water Communities***,

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ID: See Table I-1		**R:Recommended water quality protection measure M:Mandatory water quality protection measure, based on federal, state, or local rule or regulation**	
		Utilize storm water pollution control structures in new and existing development.	KDHE, March 25, 1998.
Recreation Areas			
46	Golf Courses	**R:** Develop and implement a written water quality protection plan for the golf course property and activities practiced on the golf course.	***An Environmental Approach to Golf Course Development*** - American Society of Golf Course Architects, 1999
Transportation Systems and Facilities			
83	Roads & Highways	R: Maintain vegetation along roadsides to filter runoff and slow erosion. Minimize road width (impervious areas) in new development.	
	Construction	See ***Construction Sites***	
	Runoff	**R**: Utilize storm water pollution control measures where applicable.	
	Maintenance	**R**: Conduct vehicle maintenance over impervious surfaces with appropriate collection structures.	
83.12	Deicing	**R**: Store deicing materials in a covered location to avoid contact with storm water.	
84	Spills	**M**: Immediately report all spills to the KDHE Spills Hotline at (785) 296-1679.	KSA 65-171d KAR 28-16-27
83.2	Rail Roads	**R**: Develop water pollution prevention plans to protect adjacent	

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		water resources.	
Utility Corridor			
87	Pipelines	**M**: Provide for monitoring/leak detection for pipelines.	Kansas Corporation Commission KSA 55-501
87	Utility Lines	**M**: Immediately report all spills to the KDHE Spills Hotline at (785) 296-1679.	KSA 65-171d KAR 28-16-27
Water Supply Source Water Areas			
			Kansas Local Government Water - Quality Planning Guide, K-State Research and Extension, November, 1999. ***Kansas Source Water Assessment Program Plan***, KDHE, February, 2001
	Groundwater	**R:** Develop and implement a wellhead protection plan in accordance with the principles and practices set out by the Kansas Wellhead Protection pan and the Kansas Source Water Assessment Program Plan	Safe Drinking Water Act, Section 1428 ***Kansas Wellhead Protection Program*** KDHE June 28, 1996
	Surface Water	**R:** Develop and implement a watershed management plan in accordance with principles and practices set out by Kansas Source Water Assessment Program Plan and Kansas Watershed Protection Planning Principles and Practices.	Safe Drinking Water Act, Section 1453

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Brownfields & Abandoned Sites			
88.1	Abandoned Water Wells	**M:** Plug in accordance with specifications set out by Kansas rules and regulations.	KSA 82a 1201 KAR 28-30-1

Kansas Nonpoint Source Pollution Management Plan

Table I-3 Nonpoint Pollutants, Sources and Typical Activities Producing Pollutants

	Atrazine	Biochemical Oxygen Demand	Fecal Coliform Bacteria	Nitrogen	Pesticides	Phosphorus	Salts	Total Suspended Solids
Construction Sites				Establishment of turf		Soil erosion		Erosion of bare soil
Cropland	Application to corn and grain sorghum			Application of fertilizer in amounts exceeding amounts needed for the crop.	Weed and insect control	Application of fertilizer in amounts exceeding amounts needed for the crop.		Sheet and rill erosion, gully erosion
						Soil erosion		
Farm & Home Site	Equipment clean-up	Failing on-site wastewater treatment system	Failing on-site wastewater treatment system	Failing on-site wastewater treatment system	Equipment clean-up	Failing on-site wastewater treatment system		Wash off of grit from driveways and hard surfaces
	Storage containment failures			Excessive application to lawns and trees	Storage containment failures			
					Yard and building pest control			
Livestock Confinement		Rainfall Runoff	Rainfall Runoff	Rainfall Runoff	Insect control	Rainfall Runoff		
Pasture			Livestock Grazing	Application of fertilizer in amounts exceeding amounts needed for the crop	Weed, insect and brush control			Gully erosion
Range			Livestock Grazing		Weed, insect and brush control			Gully erosion
Riparian Area		Leaf drop						Stream bank erosion
Roads & Streets	Right-of-way weed control	Spills		Spills	Spills		Deicing practices	Ditch erosion
					Right-of-way weed control			
Urban Area	Industrial site weed control	Combined & sanitary sewer overflows	Failing on-site wastewater treatment system	Combined & sanitary sewer overflows	Yard and building pest control	Combined & sanitary sewer overflows	Parking lot & sidewalk deicing	Wash off of grit from streets and parking lots
			Pet waste					
			Combined & sanitary sewer overflows					
Hydrologic Modification				Lawn and landscape plant fertilization	Yard and building pest control	Gully and erosion down stream of new impervious areas		Wash off of grit from driveways and hard surfaces
						Construction site erosion		Gully and erosion down stream of new impervious areas
								Construction site erosion