



## EPA Region 7 4B Rationale

**Water body ID(s):** KS-LA-12-533-11

**State:** KS

**Water body Names:** TURKEY CREEK

**(s):**

**Pollutant(s):** ATRAZINE

**HUC(s):** 11030012

**Basin:** LOWER ARKANSAS BASIN

**Tributary(ies):** BULL CREEK, DRY TURKEY CREEK, RUNNING TURKEY CREEK

**First Listing Cycle:** 0

**Submittal Date:** 3/31/2008

**Approved:** Yes

### Submittal Letter

*State submittal letter indicates final Maximum Daily Load(s) for specific pollutant(s)/water(s) were adopted by the state, and submitted to EPA for approval under section 303(d) of the Clean Water Act. Include date submitted letter was received by EPA and date of receipt of any revisions.*

This watershed plan 4b was submitted as part of the Kansas 2008 IR on March 31, 2008.

### Concern

*A statement of the problem causing the impairment.*

KDHE uses a watershed approach for both water quality sampling and assessment determinations. According to the Category 4b demonstration, atrazine impairments were identified at KDHE monitoring stations SC533, SC534, and SC535. KDHE has identified the three watersheds upstream of these monitoring stations as impaired for atrazine. The three atrazine impaired watersheds assigned to Category 4b and associated segments (11 total), are shown in the below.

Category 4b Watershed	Segment		
	Main	Tributary 1	Tributary 2
Turkey Creek (upstream of monitoring station SC533)	Turkey Creek, segment 11 Turkey Creek, segment 12	Dry Turkey Creek, segment 13 Running Turkey Creek, segment 25	Bull Creek, segment 24
Emma Creek (upstream of monitoring station SC534)	Emma Creek, segment 6	Emma Creek, Middle, segment 7 Emma Creek, West, segment 8	None
Sand Creek (upstream of	Sand Creek,	Mud Creek, segment 16	None

monitoring station SC535)	segment 4	Beaver Creek, segment 26	
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According to the Category 4b demonstration and further clarification from KDHE, the designated use impaired by elevated atrazine levels in the three Category 4b watersheds is expected aquatic life support. The applicable numeric atrazine criteria for expected aquatic life support are 3 µg/L (chronic) and 170 µg/L (acute) (KAR 28-16-28e(c)(2)(D)(ii)). The Category 4b watersheds and associated segments are not meeting the chronic criterion.

The Category 4b demonstration identifies the source of elevated atrazine levels as agricultural nonpoint source pollution and indicates that there are no point source dischargers of atrazine in the Category 4b watersheds. The demonstration states that atrazine has been used since the 1960's for selective control of broadleaf and grass weeds in corn and grain sorghum row crops. Because of its high solubility in water, atrazine is susceptible to removal from cropland during overland runoff events.

**EPA Assessment of Element #1:** Consistent with EPA's Category 4b guidance, EPA finds that the Category 4b demonstration identifies the impaired segments, pollutant causing the impairment, designated use not met, and source of the pollutant causing the impairments.

## Implementation Strategy

*A description of the proposed implementation strategy and supporting pollution controls necessary to achieve WQS, including the identification of point and nonpoint source loadings that when implemented assure the attainment of all applicable WQS.*

***Water quality target The demonstration should identify a numeric water quality target(s) - a quantitative value used to measure whether or not the applicable water quality standard is attained.***

According to the Category 4b demonstration and further clarification with KDHE, the atrazine water quality target is the chronic atrazine criterion for expected aquatic life support of 3 µg/L.

***Point and nonpoint source loadings that when implemented will achieve WQS The demonstration should describe the cause-and-effect relationship between the water quality standard (and numeric water quality target as discussed above) and the identified pollutant sources and, based on this linkage, identify what loadings are acceptable to achieve the water quality standard.***

The Category 4b demonstration identifies a 50% reduction in atrazine loading to each of the three KDHE sampling stations (i.e., SC533, SC534, and SC535) during the runoff period to achieve the water quality target. The runoff period, which generally occurs from April through July, represents the time when the concentration of atrazine is highest because of recent atrazine applications and increased precipitation events which result in the movement of atrazine into water bodies. KDHE's loading analysis is provided in the original Category 4b demonstration.

***Controls that will achieve WQS The demonstration should describe the controls already in place, or scheduled for implementation, that will result in reductions of pollutant loadings to a level that achieves the numeric water quality standard. The demonstration should also describe the basis***

*upon which the state concludes that the controls will result in the necessary reductions.*

As discussed above, the Category 4b demonstration targets a 50% reduction in atrazine loading to each station during the runoff period to achieve the atrazine water quality target. According to the demonstration, KDHE proposes to achieve these load reductions through atrazine control activities identified through the WRAPS process for the Little Arkansas River subbasin. These activities include (1) an outreach/education program for the agricultural community, i.e., producers, on atrazine application rates, timing, alternatives, and label instructions, and (2) an atrazine BMP program that includes BMP demonstration sites, on-farm visits by KSU extension staff to promote voluntary atrazine BMPs, and incentive payments to producers that sign up for and employ the voluntary BMPs.

The voluntary atrazine BMPs being promoted through the WRAPS process are consistent with current atrazine label restrictions; however, the BMPs go beyond the current label restrictions because they call for applying less atrazine on the ground than the label permits. The voluntary BMPs have published removal efficiencies that range from 25% (e.g., use split applications of atrazine such as 2/3 prior to April 15 and 1/3 at planting) to 100% (e.g., use no atrazine). The Category 4b demonstration states that where the BMPs with less than 50% reduction efficiencies are implemented, additional BMPs will be used such that the sum of effectiveness will be 50% or greater.

In addition to the estimated removal efficiencies, the Category 4b demonstration indicates that the voluntary atrazine BMPs being implemented under the WRAPS are effective in reducing atrazine loads and improving water quality. Specifically, the submittal indicates that water quality monitoring of “targeted” subwatersheds treated with atrazine BMPs had lower atrazine concentrations (ranging from 18% to 40%) over a two year period than co-monitored untreated subwatersheds.

**EPA Assessment of Element #2:** Consistent with EPA’s Category 4b guidance, the Category 4b demonstration provides an appropriate water quality target for atrazine, adequately identifies the loads needed to achieve the atrazine target, and provides a description of the controls and the basis upon which the controls are expected to result in attainment of the atrazine water quality target. The description identifies atrazine BMP removal efficiency estimates, watershed-specific data, and information to support that the BMPs used should be effective in reducing atrazine loads and achieving the water quality target. EPA finds that it is reasonable to expect that the controls, if implemented as planned, should lead to attainment of the atrazine water quality target.

## **Time**

*An estimate or projection of the time when WQS will be met.*

The Category 4b demonstration indicates that the atrazine water quality target is expected to be achieved in the Category 4b watersheds by 2016. This estimate is based on the overall 10-year BMP implementation schedule developed as part of the WRAPS process.

**EPA Assessment of Element #3:** Consistent with EPA’s Category 4b guidance, the 4b demonstration provides a time estimate to achieve the atrazine water quality target. EPA finds the time estimate reasonable given the case-specific considerations in these Category 4b watersheds, including the behavior of the specific pollutant, nonpoint source of the pollutant, nature of the voluntary control actions, extent of implementation that remains to be completed, and associated

implementation costs.

## Schedule

*A reasonable schedule for implementing the necessary pollution controls.*

The Category 4b demonstration provides a baseline estimate of 60,300 existing acres of corn and grain sorghum eligible for voluntary atrazine BMPs in the Category 4b watersheds. The goal is to make significant BMP implementation progress each listing cycle such that the atrazine water quality target is achieved by 2016. Thus, the current implementation strategy calls for voluntary atrazine BMPs, with an average removal efficiency of 50%, on all of the 60,300 acres by 2016. Until producers incorporate the voluntary atrazine BMPs into their standard operating procedures without incentive payments, funding will need to be available to support the outreach/education and BMP programs until the water quality target is achieved.

The Category 4b addendum Table 11 indicates that implementation of the voluntary atrazine BMPs has increased over the past three years in the Category 4b watersheds. The extent of implementation in 2008 is estimated to range from 10% in the Turkey Creek watershed to 27% in the Sand Creek watershed.

**EPA Assessment of Element #4:** Consistent with EPA's Category 4b guidance, the Category 4b demonstration provides an overall implementation schedule to attain the atrazine water quality target in the Category 4b watersheds by 2016. The submittal also identifies implementation progress made from 2006-2008, as well as the extent of implementation that remains to be completed. EPA finds the overall implementation schedule reasonable given case-specific considerations for these watersheds, including the behavior of the specific pollutant, nonpoint source of the pollutant, nature of the voluntary control actions, extent of implementation that remains to be completed, and associated implementation costs.

EPA understands that the WRAPS leadership team implementation strategy for atrazine currently encompasses the entire Little Arkansas River subbasin. EPA expects that KDHE will coordinate with the WRAPS group prior to the next CWA Section 303(d) listing cycle to convey that 1) the Category 4b demonstration focuses on three watersheds in the Little Arkansas River subbasin, and 2) continuing to make and schedule implementation progress in these three watersheds such that the implementation goal, attaining the atrazine water quality target by 2016, can be met is an important consideration in maintaining these watersheds in Category 4b.

## Monitoring

*A description of, and schedule for, monitoring milestones for tracking and reporting progress to EPA on the implementation of the pollution controls.*

The Category 4b demonstration indicates that KDHE will coordinate with the WRAPS group to provide a progress report on atrazine reduction efforts in the Category 4b watersheds by April 1<sup>st</sup> for each 303(d) reporting cycle. The report will include implementation progress for each Category 4b watershed as indicated below:

- Total acres with voluntary atrazine BMPs each year,
- Of the total acres each year, the percentage of acres of each type of BMPs used, e.g., early application, pre-plant incorporation, and the associated atrazine removal efficiency estimate for each type of BMP, and
- Total number of producers that receive on-farm visits and sign up to implement the voluntary BMPs each year compared to the total number of producers that only receive an on-farm visit

According to the Category 4b demonstration, the progress report will also include results from water quality monitoring at KDHE's monitoring stations at the downstream pour points of the Category 4b watersheds (i.e., Station SC533, SC534, SC535). These stations are sampled on a four year rotation, e.g., 2006, 2010, 2014. As appropriate, KDHE will also discuss results from KDHE and U.S. Geological Survey (USGS) permanent/fixed stations on the Little Arkansas River and directed monitoring by KSU on the Little Arkansas River, tributaries, and atrazine BMP demonstration project sites.

According to the Category 4b demonstration, KDHE believes assessing and reporting out on these multiple lines of implementation and water quality response data/information will facilitate the following:

- Assessment of progress and challenges occurring in the Category 4b watersheds,
- Clarification of what corrective actions may be needed, and
- Flexibility for the WRAPS group and KDHE to continue to demonstrate progress toward the goal of achieving the atrazine water quality target in the 4b watersheds by 2016

**EPA Assessment of Element #5:** Consistent with EPA's Category 4b guidance, the Category 4b demonstration provides a description of, and schedule for, monitoring implementation and water quality in the Category 4b watersheds. Because implementation of the proposed controls, e.g., BMPs, are voluntary actions producers will make on an annual basis, demonstrating progress toward the restoration goal, i.e. attain the atrazine water quality target by 2016, each § 303(d) reporting cycle is an important element of maintaining these watersheds in Category 4b. KDHE's proposed implementation and water quality progress report is a reasonable means to track progress in the watershed and should facilitate KDHE's and EPA's assessment of whether or not to maintain these watersheds in Category 4b for future § 303(d) reporting cycles.

### **Commitment to Revise**

*A commitment to revise, as necessary, the implementation strategy and pollution controls if progress towards meeting WQS is not being shown.*

The Category 4b demonstration indicates that KDHE is committed to continuing to offer resources and expertise to the WRAPS leadership team to enhance implementation efforts to ensure the Category 4b watersheds make progress towards meeting the goal of achieving the atrazine water quality target by 2016. The demonstration also indicates that KDHE is committed to revise the strategy if progress is not documented.

Further the submittal indicates that if participation lags or there is no tangible decrease in atrazine levels KDHE will initiate the development of a TMDL in 2011. If the watershed strategy is making progress towards meeting water quality goals in 2011-2012, but cannot yet bring about delistings in 2012, KDHE will defer the decision to develop TMDLs until 2016.

**EPA Assessment of Element #6:** Consistent with EPA's Category 4b guidance, the Category 4b demonstration provides a statement that KDHE is committed to working with the WRAPS group to revise the pollution controls in the Category 4b watersheds (if needed). In addition, waters identified as impaired in the Category 4b watersheds were originally identified as impaired for

either the 2004 (Emma Creek and Sand Creek) or combined 2006/2008 (Turkey Creek) § 303 (d) lists. Hence, KDHE's commitment to develop TMDLs for these waters by 2016 if the implementation strategy is not sufficient is consistent with EPA guidance that TMDLs be developed within 8-13 years of an impaired waters initial inclusion on a state's § 303(d) list.

**\*\*\*\*\* *Pollution control requirements in the submittal* \*\*\*\*\***

***Description of requirements under which pollution controls will be implemented***  
***The demonstration should describe the basis for concluding that the pollution controls are requirements. EPA will consider a number of factors in evaluating whether a particular set of pollution controls are in fact "requirements" as specified in EPA's regulations, including:***

- ***authority (local, state, federal) under which the controls are required and will be implemented with respect to sources contributing to the water quality impairment (examples may include: self-executing state or local regulations, permits, and contracts and grant/funding agreements that require implementation of necessary controls)***
- ***existing commitments made by the sources to implement the controls (including an analysis of the amount of actual implementation that has already occurred)***
- ***availability of dedicated funding for the implementation of the controls; and • other relevant factors as determined by EPA depending on case-specific circumstances***

**Authority**

The Category 4b demonstration indicates that producers and applicators that use atrazine in the Category 4b watersheds must comply with existing label restrictions and Kansas state law. Under Kansas state law, persons that apply atrazine are required to become certified applicators, which includes training on atrazine label restrictions, and may be subject to fines if pesticides are not used in a manner consistent with the pesticide's label.

The voluntary atrazine BMPs being promoted in the Category 4b watersheds to achieve the atrazine water quality target are consistent with atrazine labeling; however, the voluntary BMPs go beyond the current label restrictions because they call for applying less atrazine on the ground than the label allows. Hence, as discussed below, KDHE's assurances that the voluntary BMPs will be implemented and maintained are based primarily on the extent of (1) existing commitments to implement the needed BMPs, (2) dedicated funding to support full implementation of needed BMPs, and (3) other relevant factors specific to the watersheds under consideration for Category 4b.

**Existing Commitments**

The Category 4b demonstration indicates that development of the Little Arkansas River WRAPS represents a fundamental first-step commitment to restore the watershed and achieve the atrazine water quality target. The likelihood of the WRAPS being implemented is enhanced because the WRAPS leadership team that developed the strategy included agency advisors (including KSU Research and Extension, Natural Resource Conservation Service, local County Conservation Districts, and KDHE) and local stakeholders (including producers and atrazine applicators that would need to implement the voluntary BMP practices).

Implementing the WRAPS in the Category 4b watersheds involves obtaining and maintaining commitments from multiple key stakeholders, including:

- WRAPS leadership team – leading implementation of the WRAPS plan which includes the information/education and BMP programs and the identification and management of implementation funds,
- Producers – implementing the voluntary atrazine BMP programs, and
- Funding sources – funding the information/education and BMP programs

According to the Category 4b demonstration, the key stakeholders' commitment to implementing the WRAPS in the Category 4b watersheds is exemplified in their implementation actions over the past three years of 2006, 2007, and 2008. These implementation actions, which are highlighted below, have focused on six "targeted" subwatersheds in the Little Arkansas River subbasin, Upper Turkey Creek, Upper West Emma Creek, Black Kettle Creek, Upper Blaze Fork Creek, Lower Sand Creek, and Kisiwa Creek. Three of these "targeted" subwatersheds, Upper Turkey Creek, Upper West Emma Creek, and Lower Sand Creek, are subwatersheds of the corresponding Category 4b watersheds.

#### WRAPS Group Implementation Actions

Established a website to communicate information to stakeholders regarding BMP practices, goals of the WRAPS process, and general information on projects being implemented as nonpoint source management measures

Distributed an educational publication "Atrazine Best Management Practices for the Little Arkansas River Watershed" to producers

Conducted over 220 on-farm visits to promote and sign up producers for the voluntary BMP incentive program: 50 visits in 2006, 77 visits in 2007, and 96 visits in 2008.

Trained over 340 farmers and consultants in 2006 and 2007 regarding atrazine BMPs

Established and operated demonstration projects at three farm fields to learn about and promote the effectiveness of the voluntary atrazine BMPs.

Installed automated surface water monitoring systems to evaluate the effectiveness of BMP implementation

Used radio interviews and newspaper articles to educate local communities about atrazine BMPs.

Provided and managed over \$100,000 in incentive payments to producers to implement voluntary BMPs: ~\$20,000 (2006), ~\$38,000 (2007), and ~\$49,000 (2008).

#### Producers Implementation Actions

Number of producers implementing voluntary BMP practices that received on-farm visits in the "targeted" subwatersheds has generally been high: 80% in 2006, 99% in 2007, and 98% in 2008.

Number of producers participating in the voluntary BMP incentive program more than doubled over the past three years: 40 producers in 2006, 74 producers in 2007, and 95 producers in 2008.

Number of voluntary BMP acres has more than tripled over the past three years: 4,792 acres in 2006, 10,545 acres in 2007, and 13,044 acres in 2008 – the later representing about 44% of the total potential BMP acres (i.e., corn and grain sorghum acres) in the six “targeted” subwatersheds.

#### Funding Sources

Over the past three years, up to \$250,000 has been invested in the six “targeted” subwatersheds to implement the information/education and BMP programs. KDHE’s CWA Section 319 program funds represent the primary funding source, with matching contributions from within the Little Arkansas River subbasin (i.e., City of Wichita, Kansas) and the State Conservation Commission.

KDHE references the above level of commitments and implementation success in the “targeted” subwatersheds from 2006 to 2008 to demonstrate that the information/education and BMP programs can be a successful strategy for obtaining the remaining commitments necessary to achieve the atrazine water quality target for the Category 4b watersheds.

### **Dedicated Funding**

#### Cost Estimate

According to the Category 4b demonstration, KDHE anticipates that producers will eventually adopt the voluntary BMPs into their standard operation procedures without the incentive payments. Until that time, funding is needed to fully implement the information/education and BMP programs – namely funds to support the voluntary BMP incentive payments. KDHE estimates that about \$180,000/year is needed to fully fund and implement the voluntary BMP incentive payments in the Category 4b watersheds plus the Black Kettle Creek watershed.

#### Funding Sources

According to the Category 4b demonstration, the primary funding source to fully implement the plan will be EPA CWA Section 319 grant funds and State Water Plan funds that are dedicated to WRAPS and managed through KDHE. As available, the WRAPS leadership team will use supplemental or matching funds from other agencies United States Department of Agriculture (USDA) and stakeholders in the Little Arkansas River subbasin (e.g., City of Wichita, Kansas).

#### Adequacy of Funding Sources

According to the Category 4b demonstration, KDHE’s total CWA Section 319-grant allocation for WRAPS statewide is typically \$1.2 million/year matched with \$800,000 in state Water Plan funds. Because reduced atrazine levels benefit water supply sources for the City of Wichita, Kansas, supplemental funding support by the city has been provided.

KDHE also provides a commitment in the Category 4b demonstration to continue funding the Little Arkansas River WRAPS in the Category 4b watersheds through these funding sources. Among the 44 active WRAPS projects in Kansas, the Little Arkansas WRAPS is considered among the top ten in priority for implementation. Furthermore, the Little Arkansas River subbasin has been selected by Kansas to evaluate success in improving water quality in order to meet EPA’s SP-12 performance measure.

In addition, the WRAPS leadership team has successfully demonstrated an ability to obtain and manage implementation funds over the past three years.

### **Other Relevant Factors**

As described in the Category 4b demonstration, KSU was selected by the Little Arkansas WRAPS group to lead the WRAPS planning effort which encompasses research, water quality monitoring, and extension programs for the WRAPS implementation activities. Hence, there is continuity in the lead entity/organization developing and implementing the WRAPS. KSU provides a significant amount of technical expertise to the restoration process. KSU began research in the late 1980s to identify BMPs that would help control atrazine runoff into drinking water supplies and has published recommended atrazine BMPs and effectiveness. KSU staff participating in the WRAPS are trained agronomists and watershed specialists which facilitates development and implementation of a sound restoration strategy.

### **EPA Assessment**

The submittal discusses each of the factors, i.e., authority, commitments, dedicated funding, and other relevant factors, EPA considers to determine whether adequate assurances are provided that the controls needed to achieve the water quality target will be implemented. Although the proposed controls are voluntary, EPA finds the assurances adequate given the following factors:

- Commitments – Relevant stakeholders in the Category 4b watersheds including the WRAPS group, producers, and funding source [including KDHE]) have demonstrated a track record of commitments to implement and maintain the controls where the WRAPS plan has been employed (i.e., the “targeted” subwatersheds). This demonstrates that the WRAPS plan can be a successful strategy to obtain the remaining commitments necessary to achieve the atrazine water quality target for the Category 4b watersheds.
- Funding – The submittal provides a cost estimate for implementing key actions, identifies key funding sources, and demonstrates that the funding sources are adequate to meet the cost estimate. Also, KDHE has demonstrated a commitment to providing state funds to implement the WRAPS plan in the Category 4b watersheds. The WRAPS leadership team has also demonstrated a track record of obtaining and managing implementation funds.
- Other relevant factors - KSU’s involvement in the implementation efforts provides significant continuity and technical expertise to the implementation efforts

EPA understands that collection of additional data and information in the WRAPS “targeted” subwatersheds and demonstration project sites may yield more refined, site-specific estimates of BMP removal efficiencies. Such refinements may facilitate improved selection, targeting, and costing of needed BMPs. EPA expects that KDHE and the WRAPS leadership team will incorporate any such refined estimates into the implementation strategy and identify such changes in KDHE’s biennial progress report to EPA for the Category 4b watersheds.