Pleasant Run Watershed pH (H^+ Ion Mass) TMDL REVISION
Hopkins County, Kentucky
TMDL ID# 10801
August 3, 2011

A. TMDL Background:

The Pleasant Run Watershed pH TMDL ("the TMDL") was originally approved on April 7, 2004. At the time the TMDL was finalized, the document addressed the original 303(d) listed segment of Pleasant Run from River Mile 0.0 to 7.9, which was impaired for the Primary and Secondary Contact Recreation and Warm Water Aquatic Habitat Designated Uses due to low pH. For this TMDL, the loading capacity is represented by the maximum hydrogen ion loading capacity that will attain a minimum pH of 6 standard units - KY water quality criteria for pH are in the range of 6-9 standard units. The loading capacity was determined through a series of scientific equations based on the pH criteria, total dissolved solid concentration, specific conductivity, ionic strength, corresponding activity coefficients and flow. This method is described in detail in the 'Model Development' section of the document. Original TMDL allocations for the original segment are presented in Table 1.

Table 1 Original TMDL Allocations

	Critical Incremental Flow Rate (cfs)	Incremental TMDL for a pH of 6.0 (lbs/day) [1]	Waste Load Allocation (lbs/day)[2]	Load Allocation (lbs/day)[3]	Predicted Maximum Incremental Load (lbs/day)	Incremental Reduction Needed (lbs/day)
Subbasin 1	29.30	0.178	0.00	0.178	39.69	39.52
Subbasin 4	3.40	0.020	0.00	0.020	64.76	64.74
Subbasin 5	1.30	0.008	0.00	0.008	24.76	24.75
Total	**34.00**	**0.207**	**0.00**	**0.207**	**129.22**	**129.01**
Total TMDL for Pleasant Run = 0.207 lbs H+ Ions/day						

Notes: 1) The TMDL carries an implicit Margin of Safety (MOS) as described on page 16 of the document
2) Because there were no KPDES-permitted discharges to the watershed at the time of sampling or TMDL development and because new or reissued permits (with pH limits in the range of 7.0-9.0) would not cause or contribute to the existing impairment, no load was provided for the WLA category (see page 16 of the document for further discussion)
3) The LA is equal to the TMDL since the MOS is implicit and no loading is provided for the WLA (see page 16 of the document for further discussion)

B. Purpose of Proposed Revision:

The Pleasant Run Watershed pH TMDL was finalized for the original Pleasant Run segment from River Mile 0.0 to 7.9, as indicated on the 1998 and 2002 303(d) Lists. As part of the 2004 303(d) List, Kentucky divided Pleasant Run into two segments and indicated that the lower segment was also impaired for Siltation and Habitat Alterations (other than flow). Kentucky Division of Water (KDOW) is revising the TMDL to provide allocations for the new segments from River Miles 0.0 to 2.0 (GNIS ID: KY500906_01) and 2.0 to 7.8 (GNIS ID: KY500906_02), as indicated on Kentucky's current Integrated Report.

C. Justification for Revision:

The original TMDL document provided incremental TMDL, WLA and LA values for Subbasins 1, 4 and 5 of the Pleasant Run watershed. These loads are derived from monitoring data at stations on Pleasant Run at River Miles 0.3 (P1), 4.4 (P4) and 6.6 (P5), shown in Figure 1. These incremental values add up to the Total Maximum Load for the original listed segment (see Table 1).

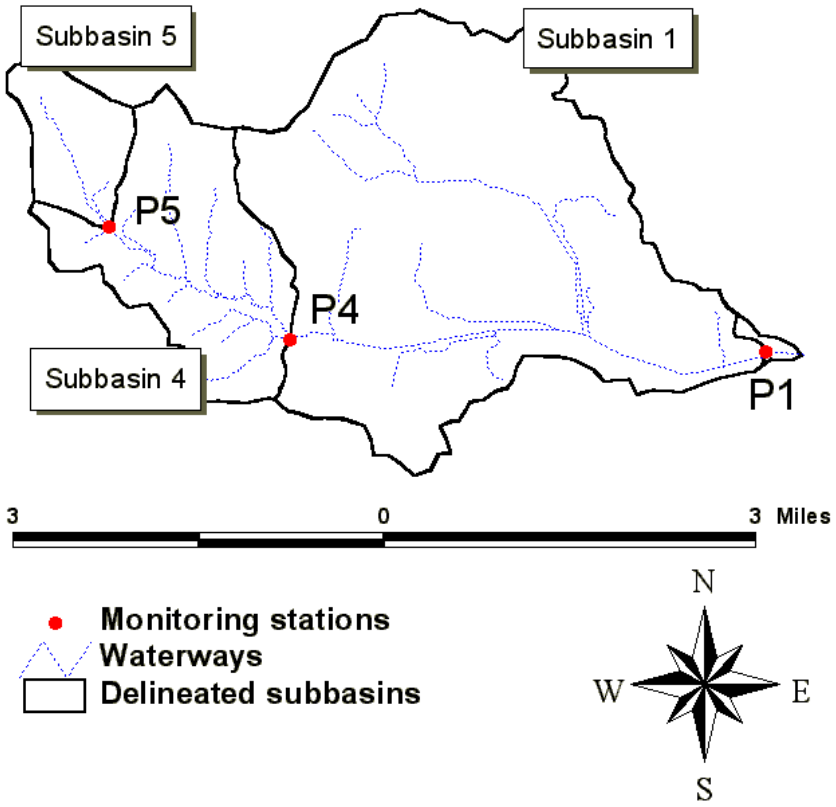

Figure 1 Pleasant Run Watershed Subbasin Monitoring Stations

D. **Revised TMDL Allocations:**

Additional stream monitoring has not taken place in the Pleasant Run watershed since TMDL development. Incremental TMDLs for the original listed segment were included in the approved Pleasant Run document at the three monitored sites shown in Figure 1. These incremental loads were used to equally divide and apply the total TMDL between the two new segments of the watershed. In order to apply an incremental TMDL to the RM 2.0 to 7.9 segment, the watershed area ratio approach was used to extrapolate the critical flow and loadings from site P4 (at RM 4.4) to River Mile 2.0, the bottom of the impaired segment. The watershed area at site P4 and RM 2.0 was determined in a Geographic Information System and its difference used to determine the ratio (see Table 2). The incremental TMDL for the RM 2.0 to 7.9 segment is the result of aggregated loadings from sites P5 and P4. The incremental TMDL at site P1 was used for the RM 0.0 to 2.0 impaired segment (after adjusting the critical flow to account for flow entering the subbasin from upstream). Table 2 depicts the revised TMDL allocations for the original segment and associated subbasins. Table 3 shows the revised TMDLs and allocations for the two new segments and associated subbasins of the Pleasant Run watershed.

The method used to derive the TMDLs at a pH of 6.0 is described in the 'Model Development' section of the document (pages 10-14); allocation and development of the incremental TMDLs is described in the 'TMDL Development' section of the document (pages 15-18). Figure 2 depicts the Pleasant Run watershed areas represented by the two new TMDL segments of Pleasant Run.

The predicted (i.e. existing) maximum loads and reductions needed do not change for the subbasins since this information is derived from monitoring data and is related more to the implementation of the

TMDL, not its development. Predicted loads and reductions were aggregated from sites P4 and P5 to represent the RM 2.0 to 7.9 segment (see Table 3).

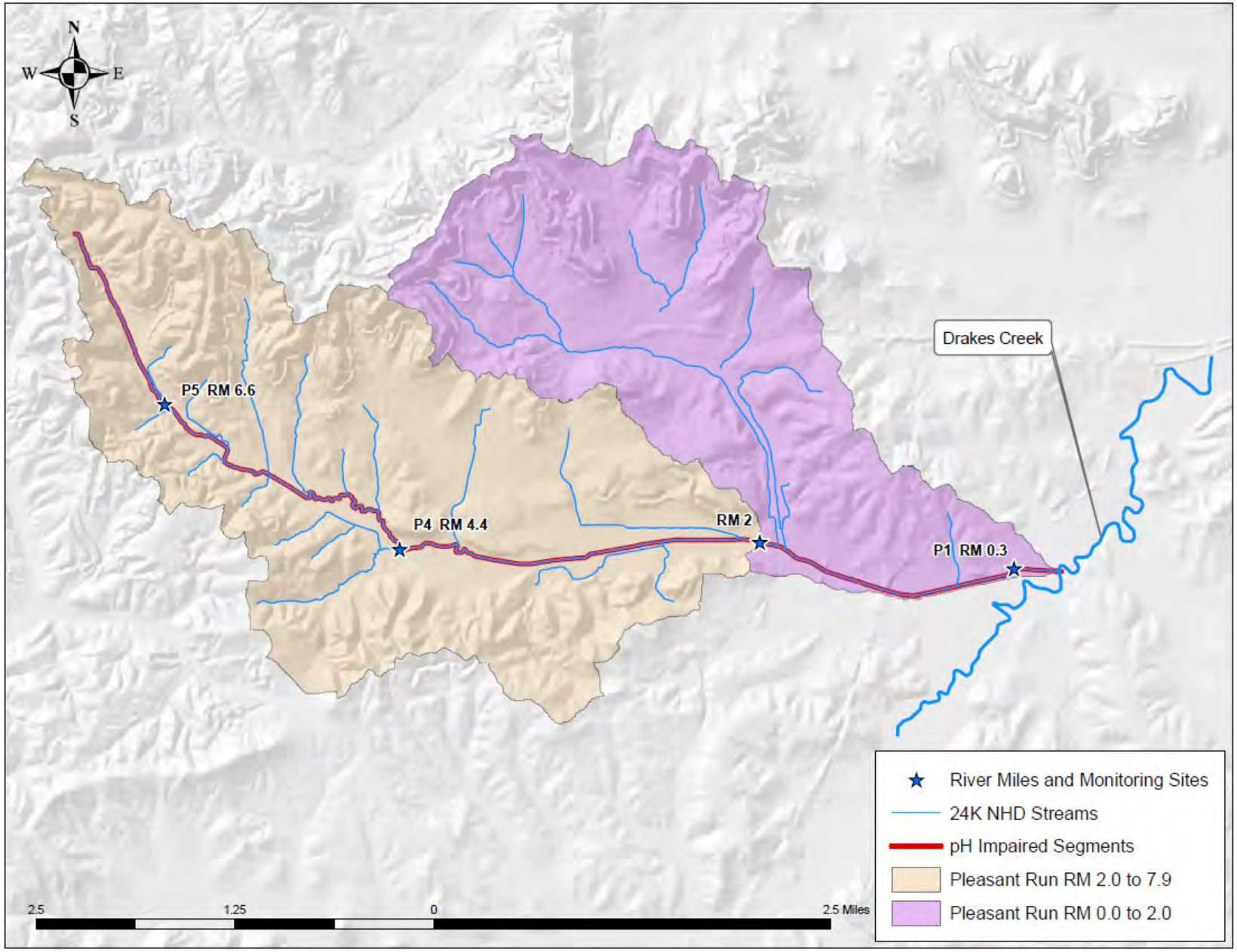

Figure 2 Pleasant Run Current TMDL Segment Watershed Areas

Table 2 Subbasin TMDL Allocations after Site P4 Extrapolation to RM 2.0

	Critical Incremental Flow Rate (cfs)	Incremental TMDL for a pH of 6.0 (lbs/day)[(1)]	Waste Load Allocation (lbs/day)[(2)]	Load Allocation (lbs/day)[(3)]	Predicted Maximum Incremental Load (lbs/day)	Incremental Reduction Needed (lbs/day)
Pleasant Run RM 0.0 to 2.0						
Subbasin 1 (at Site P1)	24.8	0.15	0.00	0.15	39.69	39.52
Pleasant Run RM 2.0 to 7.9						
Subbasin 4 (at RM 2.0)	7.9	0.048	0.00	0.048	64.76	64.74
Subbasin 5 (at Site P5)	1.3	0.008	0.00	0.008	24.76	24.75
Total	**34.00**	**0.207**	**0.00**	**0.207**	**129.22**	**129.01**
Watershed area at site P4 =2511.7 and RM 2.0 = 4930.4 Area ratio = 1.96						
Total TMDL for Pleasant Run = 0.207 lbs H+ Ions/day						

Notes: 1) The TMDL carries an implicit Margin of Safety (MOS) as described on page 16 of the document
2) Because there were no KPDES-permitted discharges to the watershed at the time of sampling or TMDL development/revision and because new or reissued permits (with pH limits in the range of 7.0-9.0) would not cause or contribute to the existing impairment, no load was provided for the WLA category (see page 16 of the document for further discussion)
3) The LA is equal to the TMDL since the MOS is implicit and no loading is provided for the WLA (see page 16 of the document for further discussion)

Table 3 Revised TMDL Allocations

	Critical Incremental Flow Rate (cfs)	Incremental TMDL for a pH of 6.0 (lbs/day) [(1)]	Waste Load Allocation (lbs/day)[(2)]	Load Allocation (lbs/day)[(3)]	Predicted Maximum Incremental Load (lbs/day)	Incremental Reduction Needed (lbs/day)
Pleasant Run RM 0.0 to 2.0 (GNIS ID: KY500906_01)						
Subbasin 1 (at Site P1)	24.8	0.15	0.00	0.15	39.69	39.52
Pleasant Run RM 2.0 to 7.9 (GNIS ID KY500906_02)						
Subbasins 4 and 5	9.2	0.056	0.00	0.056	89.52	89.49
Total	**34.00**	**0.207**	**0.00**	**0.207**	**129.22**	**129.01**
Total TMDL for Pleasant Run = 0.207 lbs H+ Ions/day						

Notes: 1) The TMDL carries an implicit Margin of Safety (MOS) as described on page 16 of the document
2) Because there were no KPDES-permitted discharges to the watershed at the time of sampling or TMDL development/revision and because new or reissued permits (with pH limits in the range of 7.0-9.0) would not cause or contribute to the existing impairment, no load was provided for the WLA category (see page 16 of the document for further discussion)
3) The LA is equal to the TMDL since the MOS is implicit and no loading is provided for the WLA (see page 16 of the document for further discussion)

E. Other Considerations

The Pleasant Run pH TMDL was developed with consideration given to the entire watershed. Although the intent of this Revision is to document allocations for each of the segments of Pleasant Run, implementation efforts should remain consistent with the spirit of the watershed approach. The 'Implementation/Remediation Strategy' section of the document (page 20) describes the approach to be used by non-KPDES-permitted sources while the 'Permitting' section (page 19) describes the approach to be used by KPDES-permitted sources in the watershed.

F. Public Participation:

The Pleasant Run Watershed pH TMDL was placed on Public Notice on June 6, 2001. Pleasant Run was re-segmented as part of the 2004 303(d) List, which was placed on Public Notice on March 5, 2004. This revision does not provide any change to the TMDL, Waste Load or Load Allocation or present any new information that has not been provided to the public for comment; therefore, further public notice is not necessary.