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Ref: 8EPR-EP

Lindsay Patterson
Division of Water Quality
Wyoming Department of Environmental Quality
Herschler Building 4W
122 W. 25th, 4th Floor
Cheyenne, WY 82002

Dear Ms. Patterson:

The U.S. Environmental Protection Agency (EPA) has reviewed the Wyoming Department of Environmental Quality's (WDEQ) October 10, 2012 letter describing a draft approach for identifying streams with insufficient flow to support a primary contact recreation use. We appreciate the opportunity to review the approach prior to public notice and the efforts of WDEQ to address some of the major concerns expressed in our May 15, 2012 comment letter on the draft recreation use attainability analysis (UAA). The EPA supports the goal of using technologies such as Geographic Information System (GIS) data to inform environmental decisions.

In general, the EPA's preliminary thinking is that WDEQ's draft approach for identifying streams with insufficient flow to support a primary contact recreation use, with some modification, would be consistent with 40 CFR § 131.10(g)(2). EPA has several suggestions for improving the draft approach and ensuring that uses are appropriately assigned to further the goals of the Clean Water Act.

Under WDEQ's draft approach, WDEQ would continue to designate all lakes, reservoirs, and ponds as primary contact recreation. WDEQ would limit the recreation UAA to low flow streams with a mean annual flow (MAF) less than 6 cfs (cubic feet/second). Such streams would be preliminarily identified as having insufficient flow to support primary contact recreation. However, such streams will be protected for primary contact recreation if those waters are proximate to areas accessible to the public and/or children as laid out in the UAA. In addition, because mean annual flow estimates are most representative of "natural" flow conditions, where permitted facilities discharge 6 cfs or more the segment will be designated primary contact to account for effluent discharges that change the natural flow in a way that allows for primary contact to be attained (e.g., ephemeral streams become perennial).

Summary of WDEQ's Low Flow Protocol

WDEQ proposes to use NHDPlus[1] estimates of flow. NHDPlus Version 1 (1:100k) includes three attributes related to flow: MAF, stream order, and watershed area. WDEQ analyzed the accuracy of all

[1] NHDPlus is an integrated suite of application-ready geospatial data sets that incorporate many of the best features of the

three and concluded MAF is the most direct and most accurate measure due to the high variability of mean annual precipitation from one region of the state to another (mean annual precipitation in Wyoming ranges from approximately 5 to 93 inches.[2] Streams with less than 6 cfs (cubic feet/second) will be preliminarily identified as having insufficient flow to support primary contact recreation , though such streams will be protected for primary contact recreation if those waters are proximate to areas accessible to the public and/or children as laid out in the UAA.

In NHDPlus, there are two methods for estimating MAF:

- Unit Runoff Method (UROM) – uses flowline catchment area estimates and unit runoff (cfs/km^2) data from HUC 8 watersheds
- Vogel Method – uses a log-log regression approach based on drainage area, precipitation, and temperature data.

Mean annual flow estimates in NHDPlus represent long term averages of daily stream flow estimates. Both methods (UROM and Vogel) use the HydroClimatic Data Network (HCDN) gages. HCDN gages are a subset of all USGS streamgages for which streamflow primarily reflects meteorological conditions rather than anthropogenic activities. The HCDN only include those gages with sufficiently long record lengths to analyze streamflow patterns over time (typically 20 years). For the 277 gages in Wyoming used to assess the accuracy of the NHDPlus flow estimates, the period of record ranged from 10 to 100 years. For the 16 Wyoming gages with mean annual flows less than 6cfs, the period of record ranged from 10 to 39 years. For the 36 gages (including gages in adjacent states) with mean annual flows less than 6 cfs, the period of record ranged from 10 to 43 years. WDEQ evaluated the accuracy of the UROM and Vogel methods for the 277 USGS gage sites in WY. The Vogel method estimated the MAF at the gages better than UROM, so WDEQ used the Vogel method where possible (100,000 segments) and used UROM for streams without Vogel estimates (120,000 segments). MAFs of the 277 USGS gage sites were estimated very well by NHDPlus ($R^2 = 0.83$) when compared to measured MAFs, although NHDPlus estimates were generally higher than actual flows (Figure 1 in the attachment to WDEQ's October 10, 2012 letter).

There are 10,293 stream miles at 1:100k without UROM or Vogel estimates. Based on information included in NHDPlus, WDEQ concludes these are generally isolated streams or constructed channels and assumes they are low flow unless those waters are proximate to areas accessible to the public and/or children. Because they are generally ephemeral tributaries, WDEQ also assumes that streams only present at 1:24k and not at 1:100k do not have sufficient flow to support primary contact unless those waters are proximate to areas accessible to the public and/or children. Of the 1:100k total stream miles (105,194), 82% (86,668 miles) have MAFs less than 6 cfs. Of these, more than 75% have MAFs less than 1 cfs. WDEQ concludes that 96,961 stream miles (86,668 + 10,293 stream miles without UROM or Vogel estimates) do not have sufficient flow to support primary contact. This number will decrease when the UAA is revised based on the use of other GIS layers to identify low flow waters that should be designated primary contact because those waters are proximate to areas accessible to the public and/or children, but WDEQ will not know by how much until the low flow protocol is incorporated into the GIS model.

In order to confirm that 6 cfs is reasonable for identifying low flow streams, WDEQ looked at their field survey photos from the 155 site visits conducted in July 2010 to depict the typical channel

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National Hydrography Dataset (NHD), the National Elevation Dataset (NED), and the Watershed Boundary Dataset (WBD). See http://www.horizon-systems.com/nhdplus/.

[2] USDA/NRCS. 2006. Precipitation - Annual 1971-2000 for Wyoming at 1:250,000. ESRI Metadata. United States Department of Agriculture/Natural Resources Conservation Service, National Cartography and Geospatial Center, Fort Worth, Texas.

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characteristics of streams with MAFs less than 6 cfs and greater than 6 cfs.[3] WDEQ also analyzed the relationship between mean annual flow and recreation season depth by using USGS field data to calculate estimated mean recreation season depths for the 28 USGS gage sites with mean annual flow less than 6 cfs, which ranged from 3.6 – 9.6 inches.[4]

EPA Suggestions

First, the EPA recommends that WDEQ include, either in the low flow approach or the broader UAA, language that more clearly links how low flow below 6 cfs, in combination with the suite of public access factors, prevents the attainment of a primary contact recreation use for those water segments. The EPA's understanding is that WDEQ selected 6 cfs based on the relationship between MAF and mean recreation season flow at USGS gauge sites in Wyoming (Figure 4 in the attachment to WDEQ's October 10, 2012 letter). Below 6 cfs, there is less variability in the data and most of the data points are near or below the regression line which indicates MAF is accurately predicting the flows people might experience during the recreation season. The EPA would be happy to discuss with WDEQ how these factors can be more clearly linked in the UAA to the appropriate use designation.

Second, to ensure protection consistent with the CWA and its implementing regulations, it is important that WDEQ modify the draft to clarify in the UAA that pools or other features that support primary contact recreation that are not currently captured by the model will be designated for primary contact recreation, just as it already does for ponds, lakes and reservoirs (see the "Waterbodies" section on page 13 of the draft low flow approach). Public review of the revised UAA and the proposed use designations for individual waterbodies will be critical. We urge WDEQ to reach out to recreational user groups as part of the public process to identify any areas where the model may be underestimating flows or missing isolated pools that may support primary contact recreation. We also recommend WDEQ conduct a public meeting prior to the notice and comment period to explain the model and show people how they can access the information relevant to the waters they care about because many people may be inexperienced with GIS technology.

Finally, although NHDPlus Version 1 contained the best available estimated flow data at the time the WDEQ developed its model, the EPA suggests WDEQ consider using NHDPlus Version 2. In Version 2, an Enhanced Runoff Method (EROM) is used in place of UROM. The improved quality of the input data and the additional variables incorporated into EROM should result in better flow estimates than the Version 1 UROM flow estimates. Another advantage of Version 2 is that standard error estimates can be computed. Version 1 was released in 2006, and Version 2 finished its public release on September 30, 2012. The EPA recognizes this release is late in the state's model development process, but encourages the state to consider utilizing the more refined dataset, if not for this UAA, then during the state's next triennial review process.

[3] According to the U.S. Drought Monitor (http://droughtmonitor.unl.edu/archive.html), most of Wyoming was not experiencing drought at this time, indicating the water levels during the site visits should be representative of conditions recreationists would be likely to encounter. Only the western edge of the state had D0 (abnormally dry) and D1 (moderate drought) conditions.

[4] The EPA acknowledges that stream depth varies along a segment and it would be difficult for any model to accurately capture this variability. The EPA cautions states interested in using depth as the justification for removing primary contact that we are not aware of GIS stream depth data that would be scientifically defensible to make such a demonstration.

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Conclusion

We recognize that this approach may not be appropriate in all parts of the country. The EPA considered the fact that Wyoming is one of the driest states in the nation. Between 1971 and 2000, the average annual precipitation for Wyoming was 12.97 inches – only the states of Utah and Nevada were drier.[5] During that time period, only 21% of Wyoming averaged more than 20 inches of precipitation per year and 67% of the state received less than 16 inches of precipitation per year.[2] WDEQ also proposes to use a suite of factors to evaluate public access, which the EPA has encouraged because such variables can be important in determining whether a factor listed in 40 CFR § 131.10(g)(2) is truly preventing attainment of a recreation use.[6]

In summary, the EPA's preliminary thinking is that WDEQ's draft approach for identifying streams with insufficient flow to support a primary contact recreation use, with some modification, would be consistent with 40 CFR § 131.10(g)(2). Specifically, the EPA recommends that WDEQ clarify in the UAA and/or public notice that pools or other features that support primary contact recreation that are not currently captured by the model will be designated for primary contact recreation. The EPA recognizes that WDEQ significantly improved the draft approach by: (1) strengthening the connection to 40 CFR § 131.10(g)(2); (2) clarifying the "category" of waters is low flow waters (not lakes, reservoirs, etc.); (3) addressing our concerns about protecting child's play in low flow streams; and (4) addressing our concerns about permitted discharges changing the natural flow in a way that allows for primary contact to be attained. The EPA looks forward to seeing the revised UAA and WDEQ's responses to our other May 2012 comments.

Please note that these comments are preliminary in nature and should not be interpreted as final Agency decisions under CWA § 303(c). If you have any questions, please call Tonya Fish on my staff at (303) 312-6832.

Sincerely,

Sandra Spence, Chief
Water Quality Unit

[5] http://www.esrl.noaa.gov/psd/data/usclimate/pcp.state.19712000.climo.

[6] (63 Fed. Reg. 36742, 36756 (July 7, 1998) and the EPA Region 8's 1992 Guidance *Recreation Standards and the CWA Section 101(a)(2) "Swimmable" Goal* at http://www.epa.gov/region8/water/wqs/wqsdocs.html.

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