2014 Water Quality Assessment Submittal to EPA
4b Analysis for Deadman and Meadow Creeks
September 2015

The Washington Department of Ecology (Ecology) Integrated Report (IR) proposes to exclude the following listings in Deadman and Meadow Creeks from the 303(d) list and place them into category 4b of the IR:

- seven listings (18827, 18828, 18829, 18830, 18831, 18832, and 40534) for temperature
- six listings (40553, 40554, 40555, 45999, 46000, and 72286) for bacteria
- three listings (47172, 47173, and 47174) for dissolved oxygen
- four listings (50438, 50473, 50474, 50475) for pH

These segments were in various categories of the 2012 IR. Listings 18827, 18828, 40534, 40554, and 40555 were in category 4b. Listings 18829, 40553, 40555, 50438, 50475, 18830, 18831, 46000, 47172, 47173, 50473, and 50475 were in category 5. Listing 18832 was in category 1. Listing 45999 was in category 2. Listing 72286 was in category 3.

Ecology's basis for excluding these waterbodies from the 303(d) list is outlined in this evaluation.

Identification of Segment and Statement of Problem Causing Impairment

Deadman Creek is located in Garfield County in southeastern Washington. It flows through rolling hills before emptying into the Snake River. This is arid country, with rainfall in some areas averaging as little as 11 inches annually. Historically, the surrounding hills were covered in bunchgrass and sage, and the meandering creek provided habitat for Steelhead trout. Approximately half the watershed today is used for non-irrigated crops such as wheat and barley, primarily in the high areas of the watershed. The other half, primarily the bottomlands near streams, provides range for livestock. From November through March, cattle are typically fed along the valley floor, which serves as a refuge from the region's harsh winter weather.

This is a sparsely populated area. There are no towns in the watershed and no point sources of pollution. The few farmhouses are widely dispersed in the watershed, and there is no evidence that septic systems are contributing pollution to streams.

Data for all pollutants and segments was collected by Washington State University (WSU) and the Washington Department of Fish and Wildlife (WDFW) between 2000 and 2007. WSU's data showed excursions above the criteria for both temperature and fecal coliform. Data collected by the Washington Department of Fish and Wildlife shows that the highest daily temperatures occurred in 2001. For segment 18827, data show a 7-day mean of maximum daily temperature of 24.3 degrees Centigrade, with a maximum daily temperature of 25.6 degrees Centigrade from continuous measurements. For segment 18828, data show a 7-day mean of maximum daily temperature of 20.7 degrees Centigrade, with a maximum daily temperature of 21.8 degrees Centigrade from continuous measurements. Dissolved oxygen data show consistent excursions below the criteria. pH data show both high and low pH excursions.

The impairments are the result of a combination of factors. Winter feeding and uncontrolled livestock access to the stream had eliminated much of the vegetation within the stream corridor. This degraded riparian area could not provide shade to the stream, resulting in high water temperatures. It also allowed manure to run directly into streams. In addition, the uncontrolled stream access allowed cattle to deposit manure directly into the water and to trample stream banks. The creek was shallow, wide, and muddy in many areas due to cattle trampling, and provided little habitat for Steelhead trout.

Description of Pollution Controls and How They Will Achieve Water Quality Standards

Water Quality Target

The designated uses for the temperature impaired segments are spawning, rearing and migration, and the temperature criterion is 17.5 degrees Centigrade, year-round. Segments 18827 and 18829 also have a supplemental spawning criterion of 13 degrees Centigrade from February 15 to June 1.

The designated use for the fecal coliform impaired segments is primary contact recreation. Fecal coliform levels must not exceed a geometric mean value of 100 colonies/100mL, with not more than 10 percent of all samples (or any single sample when less than ten sample points exist) exceeding 200 colonies/100mL.

For the dissolved oxygen impaired segments, the standards require that the lowest one-day minimum be no lower than 8.0 mg/L.

For the pH impaired segments, the standard requires the pH to be within the range of 6.5 to 8.5, with a human-caused variation within this range of less than 0.5 units.

Controls that will achieve water quality standards

The Department of Ecology's Eastern Regional Office has established a Livestock and Water Quality Program that uses a unique collaborative approach to address livestock-related problems. Instead of using the standard process that starts with a Category 5 listing, establishing a TMDL for the stream, writing an implementation plan, and finally getting to actual implementation, this strategy goes straight to implementation. The strategy is applied in watersheds in which the cause of a water quality impairment is clear.

Ecology encourages implementation of a wide variety of best management practices, however, a primary focus of the program has been to restore degraded riparian corridors and eliminate unlimited animal access to streams. Healthy riparian areas can improve water quality and stream health in multiple ways, which make them a particularly valuable and cost-effective management practice. Healthy riparian areas

- Slow bank erosion by holding soil in place during periods of high water.
- Reduce flood damage and sedimentation by slowing runoff and capturing the sediment that would otherwise be carried downstream.
- Help keep water cool in summer by shading the stream.
- Improve water quality by capturing sediment, nutrients, pesticides, pathogens, and other pollutants before they reach the stream.

- Enhance summer stream flow by improving water infiltration and storage.
- Create fish and wildlife habitat.
- Limit livestock manure inputs to the creek and riparian areas.

Ecology has a three-step riparian restoration strategy, which allows the department to efficiently apply resources to priority problem areas. The first step is to address the source of degradation – unlimited livestock access to streams and winterfeeding operations in close proximity to the riparian corridor. Ecology relies primarily on livestock exclusion, and off-stream water supply to restrict livestock access to the riparian area. In implementing this BMP, Ecology uses NRCS riparian buffer standards, which require a minimum 35 buffer between the livestock fence and the mean ordinary high water mark of the nearest stream bank. In many cases, the buffer width may be larger depending on the stream and site conditions.

By first addressing livestock access, Ecology seeks to abate the primary pollution sources—livestock in the stream, eroded streambanks, increased runoff, increased sedimentation, and subsequent transport of fecal matter. As vegetation naturally returns in the riparian area, site conditions become stabilized and the pollution sources are dramatically reduced. Also, this approach works to arrest morphological changes to the entire stream that are induced by erosion and sedimentation.

Ecology has spent much of its efforts and resources implementing this first step, in large part, because we have taken a holistic, watershed approach to protecting streams. By first addressing the primary sources of pollution and geomorphic change, Ecology can establish the necessary site conditions for successful restoration. Moreover, Ecology ensures that, first and foremost, the root problems are addressed for *the entire stream*, before resources are focused on site or segment specific restoration.

The second step occurs after a majority of site conditions have been stabilized, and the stream's entire geomorphic integrity is no longer jeopardized by the adjacent management practices. Ecology then conducts a reach by reach assessment to determine the appropriate trees and shrubs to be used for restoration. In some cases federal programs require revegetation as part of the cost-share program, and so restoration work occurs simultaneously with livestock exclusion.

The third step is to work with local land owners to promote continuous and proper management of upland grazing lands.

Ecology teams with conservation districts, local governments, and landowners to provide technical assistance and funding for implementation of best management practices. Ecology uses a traditional regulatory process only when collaborative efforts fail. Chapter 90.48 RCW gives Ecology the authority to take enforcement actions against nonpoint polluters.

The result of these partnerships has been the implementation of best management practices at hundreds of sites where water quality and fish habitat issues exist. By using a collaborative strategy, backed up by enforcement when necessary, Ecology has been able to create relationships and build trust with rural residents while improving water quality.

In the Deadman Creek watershed, work with landowners began in 2002. Twenty-nine miles of riparian buffers were installed. The creek was fenced to protect it from livestock, and several off-stream watering facilities were installed. Feeding locations were moved away from the stream to prevent polluted runoff. Trees and shrubs were planted to stabilize banks, shade the stream, and provide wildlife habitat. Buffers are constructed using Natural Resource Conservation Service standards, which require a minimum width of 35 feet. For buffers installed with state or federal financial assistance, we require an agreement with the landowner stipulating that the buffer and fence will be maintained for at least 10 years.

Fencing was generally installed adjacent to or upstream of the impaired segments. However, we are also fencing portions of the stream where there are presently no Category 5 listings, but where there is unrestricted cattle access to the stream. Riparian buffers are left to revegetate naturally in those areas in which there is enough live native vegetation left to recover. In all other areas we are installing buffers by planting native plants. By 2008, 80 percent of the cattle had been fenced out of the stream.

Most BMPs remain in good shape, although there was some backsliding prior to Ecology's 2013 re-assessment of the watershed. There had been gates and stream crossings left open and a few sections of fence that had not been completed. These are fixed now. In spring of 2014, ¾ mile of new cattle exclusion fence was installed in Meadow Creek and ¼ mile in Deadman Creek. Ecology has collected data that indicates an improving trend in the watershed, but there are data gaps so it is inconclusive, and the water is not yet meeting standards.

Description of requirements under which pollution controls will be implemented
It is Ecology's best professional judgment that the pollution controls that have been installed will result in the water quality standards being met. Maintenance of these controls has been ensured through 10-year landowner agreements that were established as part of the funding agreements for these projects.

Estimate or Projection of Time When Water Quality Standards Will be Met

It will take time for the riparian corridor to fully recover and for the stream to re-establish its natural geometry. Ecology estimates that the riparian buffers will have grown enough to be fully effective in 10 years, so Deadman Creek will be meeting temperature, fecal coliform, dissolved oxygen, and pH standards throughout the entire watershed by 2020.

Schedule for Implementing Pollution Controls

As described earlier in this report, Ecology has worked with the conservation district, local governments, and landowners to implement a variety of best management practices in the Deadman and Meadow Creeks watershed. It is our best professional judgment that this work will remedy the pollution problems in the impaired segments. Because it is our intention to restore the entire watershed and to prevent future pollution problems, we will be using monitoring data to track water quality improvements and to identify any new problem areas so they can be addressed. It will be an on-going process to get water bodies into compliance and to keep them in compliance.

A few sites where cattle are adversely affecting water quality remain in the watershed, and Ecology's Livestock and Water Quality Program will continue working with landowners to address these problem areas.

In addition, farmers throughout the watershed are adopting conservation tillage practices that reduce soil erosion and keep sediment out of the stream. These practices also improve rain and snowmelt infiltration and reduce the change of damaging spring floods. A new challenge in the watershed is a noxious weed called False Indigo. As cattle are excluded from the stream corridor, this aggressive invader moves in. The Pomeroy Conservation District has a grant from the Department of Ecology to remove the weed and plant native trees and shrubs in its place. Ecology's livestock and water quality program will continue to have an on-going presence in the watershed, and will continue working to achieve compliance with state water quality standards.

Monitoring Plan to Track Effectiveness of Pollution Controls

Monitoring results will be used to establish whether these projects are improving water quality and overall stream health. Monitoring data can also help to identify additional problem areas that should be addressed. Monitoring results will be reported to the public and EPA through Ecology's IR report development process.

Commitment to Revise Pollution Controls as Necessary

Ecology will maintain a presence in the Deadman Creek watershed to ensure that water quality continues to improve. We fully expect the Eastern Regional Office Livestock and Water Quality Program to achieve compliance with water quality standards. However, if it does not, Ecology will work with the conservation district, local governments, and landowners to determine other controls that could be used to achieve compliance.