

Water Quality Standards Revision, West Division Main Canal near Hermiston, Oregon

Submitted to: Public Review Draft

September 28, 2011



State of Oregon
Department of
Environmental
Quality



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Executive Summary

The Oregon Department of Environmental Quality (Department or DEQ) is revising water quality standards for the West Division Main Canal (WDMC), a constructed irrigation canal near Hermiston, Oregon. Over the years, as DEQ developed water quality standards across the state, beneficial use designations were over-generalized in some instances. DEQ is revising water quality standards that apply to the WDMC to reflect the ways the canal is actually used. The impetus for this action is a request by the City of Hermiston to discharge highly-treated municipal wastewater to the canal during the irrigation season, where it would mix with canal water and then be reused for irrigation. The City indicated that the state's designated beneficial uses for the canal are incorrect, and that revising the standards to designate a more appropriate list of uses would make discharge to the canal a viable option for re-use of the City's wastewater. After evaluating the canal, DEQ agreed that it was never intended or suitable for some of the broadly designated uses, such as drinking water and fishing.

Under the City's current National Pollutant Discharge Elimination System (NPDES) permit, it may discharge effluent to the Umatilla River year round, or apply the treated effluent directly to crops (land application) during the irrigation season. The City's proposed discharge to the canal would also require an NPDES permit, which would provide for discharge to the river and the canal depending on the season. Currently the Umatilla River does not meet the water quality standard for temperature. Decreased temperature is a high priority for Umatilla Basin watershed restoration efforts. Discharging the City's warm wastewater to the canal rather than the river during the warm season would support progress towards this priority.

Federal regulations require that, at a minimum, existing beneficial uses of waters of the nation be protected. As such, when removing or revising designated uses, DEQ must ensure that existing uses continue to be protected and that water quality standards include criteria sufficient to support the revised uses. The federal regulations also require a use attainability analysis (UAA) when any of the uses specified in Section 101(a)(2) of the Clean Water Act (CWA or Act) are removed or revised in a manner leading to less stringent criteria. The uses identified in this CWA section are described as those that provide "for protection and propagation of fish, shellfish, and wildlife and recreation in and on the water." DEQ proposes to remove and revise certain Section 101(a)(2) uses for the WDMC and therefore this document serves as a UAA. Existing uses are not being removed. This action corrects uses that DEQ designated for the canal as part of its broad designations for all waters of the Umatilla subbasin. In addition, as described in further detail in this document, the waterbody is man-made and was never a natural stream. The level of assessment presented in this document is commensurate with these facts.

The current designated beneficial uses for the WDMC are:

- public domestic water supply,
- private domestic water supply,
- industrial water supply, irrigation,
- livestock watering,
- fish and aquatic life (reband trout),
- wildlife and hunting,
- fishing,
- boating,
- water contact recreation,
- aesthetic quality and
- hydropower.

The Department proposes to remove five of these designated uses: public and private domestic water supply, fish and aquatic life, fishing, and boating.

Based on DEQ's evaluation of the attainable uses for the WDMC and its subsequent proposed revisions to the designated uses, DEQ has identified irrigation, livestock watering, and water contact recreation as the highest attainable beneficial uses. In addition to the proposed revisions to the designated uses, DEQ proposes to adopt numeric criteria recommended by the US Environmental Protection Agency (EPA) to protect the revised uses of the canal. To augment the numeric criteria and to address situations that may arise regarding pollutants for which numeric criteria do not exist, DEQ is also proposing narrative criteria for the WDMC.

1 Introduction

DEQ proposes to revise water quality standards for the WDMC located near Hermiston, Oregon. This action corrects the prior beneficial use designations for the canal and establishes criteria that protect the revised uses. To this end, this document describes the canal, its operation and setting, and the timing and volume of canal inputs and return flow. The document also describes DEQ's analysis of the current designated beneficial uses, the extent to which those uses are existing or attainable, and DEQ's proposed revisions to beneficial uses based on that analysis. Finally, the document identifies the water quality criteria DEQ proposes to protect the revised uses of the canal and the supporting information for those criteria.

The WDMC is a relatively large constructed irrigation canal near Hermiston, Oregon. It carries water westward from the Umatilla and Columbia Rivers to area farms, with its terminus west of the City of Boardman. Because Oregon designated uses broadly (i.e. all waters of the Umatilla Subbasin), uses such as drinking water and fishing were designated for the canal as well. In fact, the existing uses of the canal are more limited, with the primary uses being irrigation and to a lesser extent, livestock watering. The Department considers the current standards to be inappropriate for the nature and purpose of the canal.

For the purpose of changing the designated uses and associated water quality criteria, the information in this document serves as the UAA required by federal regulation. Under state and federal law, Oregon water quality standards are adopted as administrative rules by Oregon's Environmental Quality Commission (EQC) and require approval by the EPA to become effective under the CWA. This document provides the basis for the change in uses and associated criteria for the WDMC contained in the proposed rules revisions. It is the core part of a rule-making package to establish revised standards for the WDMC.

The City of Hermiston wastewater treatment plant (WWTP), which has a National Pollutant Discharge Elimination System (NPDES) permit allowing it to discharge to the Umatilla River, has requested to discharge highly treated effluent to the WDMC where it can be re-used for irrigation. The City prefers this alternative to that of discharging to the Umatilla River during the irrigation season, when it is challenging for the WWTP to meet effluent limits for temperature due to low flow in the River. The Umatilla River is designated for various aquatic life uses, including salmonid rearing, which is temperature-sensitive. Potential impacts to these uses associated with the City's effluent will be eliminated if the City is able to remove its discharge from the river. Another alternative considered by the City, that is currently utilized on an intermittent basis, has been direct land application of its effluent, but the City is planning canal discharge instead, citing practical reasons. The City's planned discharge to the WDMC will be facilitated by designating accurate beneficial uses and appropriate water quality criteria for the canal. **Appendix 8.1** contains further information regarding the City of Hermiston's WWTP planning.

DEQ proposes to remove public domestic water supply, private domestic water supply, fish and aquatic life, fishing and boating as designated uses. None of these are existing uses. The proposed designated beneficial uses include the existing uses for the canal, which are irrigation, livestock watering, wildlife and hunting (as an aggregate category, but hunting does not occur) and aesthetic quality. Limited water contact by humans is assumed to occur as well and the water contact recreation use designation will be retained to account for this. In addition, the feasibly attainable designated uses of industrial water supply and hydropower will be retained, although their likelihood of occurrence is remote.

2 Background

2.1 Canal Description

The WDMC is located near the Cities of Hermiston and Boardman near Oregon's northern border (**Figure 1**). The head of the canal diverts water at Three-Mile Falls Dam (**Figure 2**) on the Umatilla River. From there, the concrete-lined part of the canal extends 27 miles, predominantly westward to approximately four miles southwest of Boardman, Oregon (**Figure 3**). Canal overflow then exits the main concrete structure and flows northward via two channels that reconnect at a point roughly one mile southwest of the I-84 Boardman Rest Area. This single channel then continues to the Rest Area and north to the Columbia River (**Figure 4**). Unlike the original concrete structure, these overflow channels may have been historic ephemeral drainage-ways. Irrigators have partly lined the western overflow branch with concrete after the original canal was built. For purposes herein, *WDMC* refers to the entire canal, including the original concrete structure and overflow reaches, as illustrated in **Figure 3** (red line).

The WDMC was built by the US Bureau of Reclamation (USBR) and is operated by the West Extension Irrigation District (WEID). WEID participates in the Columbia River exchange of the Umatilla Basin Project, with the USBR as project partner and facility owner. The canal itself is owned by the USBR.

Figure 1. Location of West Division Main Canal
(the black lines with the Oregon border are basin boundaries – WDMC is in the Umatilla/Mid-Columbia/Lake Wallula Basin)

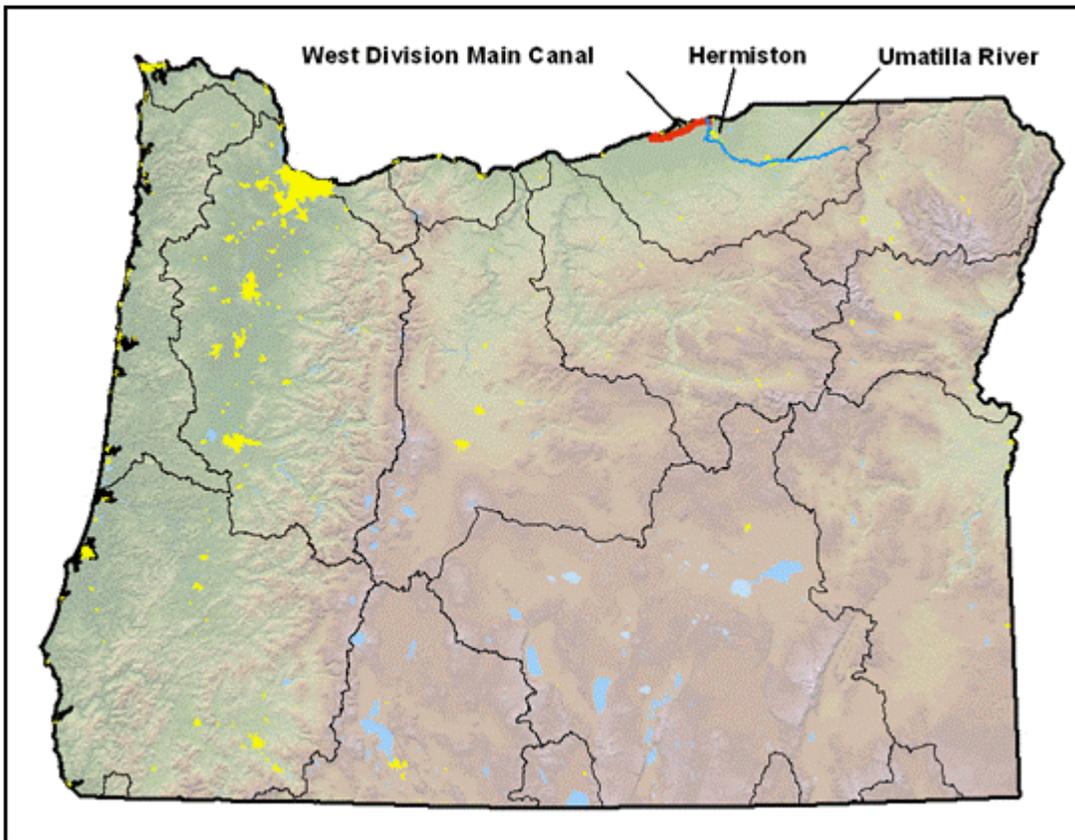


Figure 2. Aerial photograph of Three-Mile Falls Dam and WDMC point of diversion from the Umatilla River
(National Agriculture Imagery Program – NAIP, 2005)

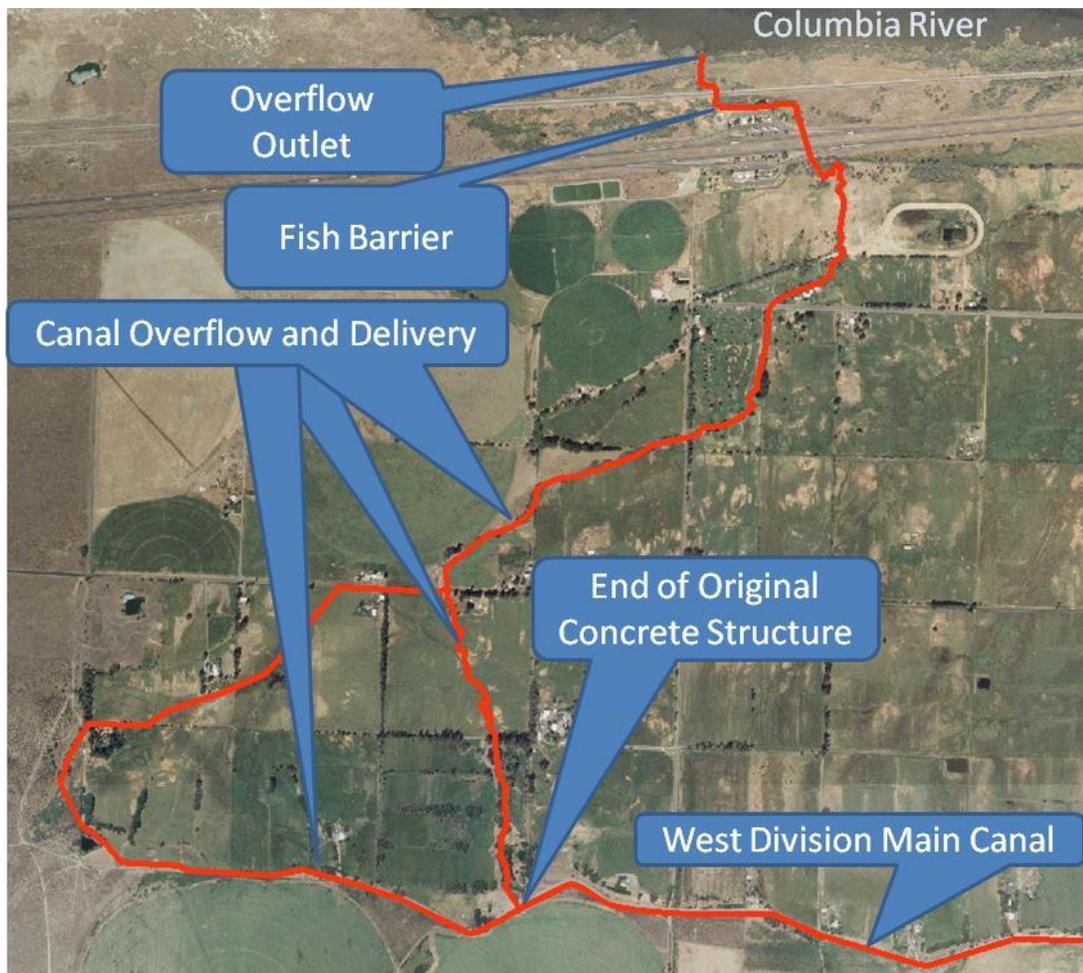


(refer to **Figure 3** for location reference)

Figure 3. Aerial photograph of WDMC area, canal shown in red (NAIP, 2005)



Figure 4. Aerial photograph of west end of WDMC
(Enlargement of the western most area of **Figure 3**, NAIP, 2005)



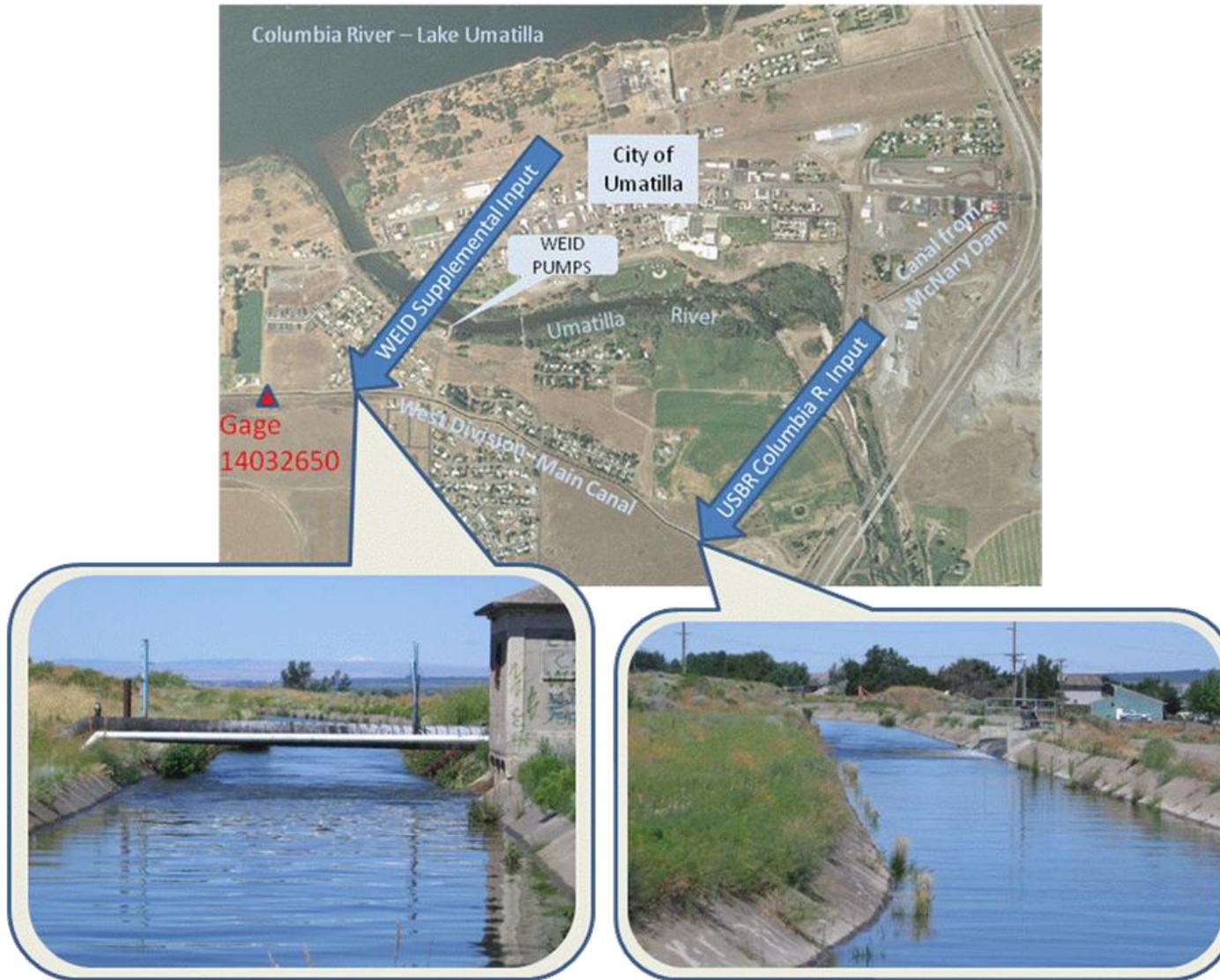
Source and timing of canal water. The WDMC draws water from both the Umatilla and Columbia Rivers. This follows from State and Federal provisions for management of Umatilla River water (Oregon water rules, 1980 Northwest Power Act and 1988 Umatilla Basin Act) and decisions of natural resource managers who implement these provisions. The current fish-flow goal for the lower Umatilla River, established in 2006, is to maintain at least 250 cubic feet per second (CFS) instream most of the year, and at least 75 CFS instream during July 1- August 15, if climatically available and not otherwise appropriated – typically available in-river flow does drop below 75 CFS in August. Umatilla River target flows are measured at the river mile 2.1 US Geological Survey (USGS) gage below Three-Mile Falls Dam. In order to maximize instream flow towards meeting these targets, the Umatilla River diversion into the WDMC is replaced by Columbia River water when the Umatilla River falls below target flows. The USBR provides 'exchange' flow (Umatilla Basin Project) to the canal from the Columbia River rather than from the Umatilla River during this time. The exchange has been operational since the 1980's. Beginning in 2006, Basin aquatic resource managers substantially increased their emphasis on not de-watering the Umatilla River in July-August below Three-Mile Falls Dam, as indicated in **Table 1**.

Table 1. Time-series minimum August flows in Umatilla River below Three-Mile Falls Dam (gage data from Oregon Water Resources Department (OWRD) –USGS gage at river mile 2.1)

Year	August Minimum Flow (CFS)
2010	81
2009	63
2008	106
2007	46
2006	68
2005	1.2
2004	13
2003	1.5
2002	1.3
2001	8.2
2000	44
1999	1.0
1998	1.1
1997	2.2

The Columbia River exchange input to WDMC (**Figure 5**) is located approximately two miles down-canal from the Umatilla River point of diversion. In addition, WEID may pump supplemental water from the Columbia pool via a pumping station at the Umatilla River's mouth, also shown in **Figure 5**. The designated irrigation season is March 1 through October 31, but the canal usually runs March 15 through October 31. Based on these factors, the WDMC typically derives water from the Three-Mile Falls Dam pool on the Umatilla River from mid-March through mid-June or July and then from the Columbia River at or near the City of Umatilla from then until October 31. Normally, no water is routed to the canal between November 1 and February 28.

Figure 5. Location of inputs to WDMC, from Columbia River (NAIP, 2005; OWRD online photos)



Volume of canal input water. The canal headwater flow ranges from 30 to 175 CFS (**Figure 6**) during the growing season, as measured in the canal below the Columbia River inputs (gage #14032650, **Figure 5**). This lower gage assesses the entire flow entering the canal, as it is located below all three river source inputs, and diversion is minimal above this gage.

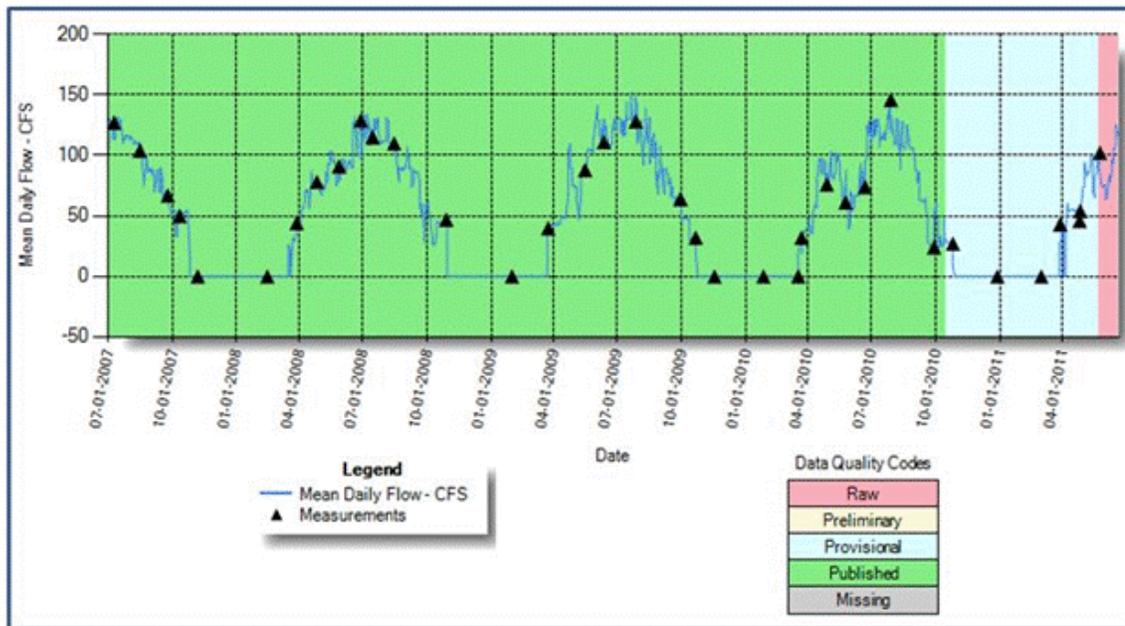
After the Umatilla River diversion is closed, sluggish standing water remains in the uppermost canal section due to seepage through the headgate below the Three-Mile Falls Dam fish bypass facility. This slack water extends down-canal roughly one mile to a ramp-flume. This flume backs up Umatilla River water and then drops to where the more energetic Columbia River water circulates up-canal from its point of introduction, during the remainder of the irrigation season.

Much of the canal-proper is dry in the off-season. WEID typically conducts essential annual maintenance on the WDMC during this dry period. During the off-season, in a few areas water may pond temporarily behind the check dams, and in certain areas groundwater enters the canal. Groundwater input occurs primarily in areas 15 miles from the Umatilla River headgate and near Boardman.

Volume of overflow. The overflow exiting the end of the lined canal ranges from zero to 30 CFS during the irrigation season. Some of this is consumed through ten water rights downstream from the end of the main canal structure. These water rights rely on diversion directly from the overflow channels.

Year round, the WDMC's return flow entering the Columbia River is typically 0.5 to 6 CFS, with WEID targeting 3 to 6 CFS during the irrigation season. Based on topographic maps, this overflow channel system appears to be a natural low, and as mentioned previously may have existed as ephemeral drainage-ways prior to canal construction in the early 1900s. The source of water in this drainage after canal shut-off is largely ground water from area irrigation with year round lag-effect due to the slow rate of groundwater transport.

Figure 6. Gage discharge for WDMC just downstream from the points of Columbia River input (data from OWRD website, gage #14032650)



Canal Structure. The canal's point of diversion, Three-Mile Falls Dam on the Umatilla River, is two miles south of Umatilla, Oregon, and has a structural height of 24 feet, a hydraulic height of 23 feet, and a crest length of 915 feet. The canal is a trapezoidal channel that is approximately 28 feet wide and 7 feet deep. It

has a diversion capacity of 375 CFS (USBR website), though as mentioned earlier, the flows in the canal are typically less than 150 CFS. There are check dams in various places in the canal to prevent flows from traveling upstream. There are gates or valves on each delivery from the main canal. The original concrete structure is a single un-branching artery. All diversions except for one are located below the points of Columbia River water input. The City of Hermiston is collaborating with WEID to re-locate this diversion to a point below the Columbia River water introduction.

The canal's main reach is continuously lined with concrete for 27 miles, from the Umatilla River head gate to an overflow structure southwest of Boardman (**Figure 3**). Downstream from this structure and as stated previously, canal water flows through two overflow channels, and then these flows reconnect. The resulting single channel then flows past the Boardman I-84 Rest Area, and under a railroad track to the Columbia River. The overflows are earthen channels, except where irrigators have concrete-lined part of the western branch. The length of the overflow channel system, from the main canal to the Columbia River, is approximately two miles (1.5-mile direct line to Columbia River).

At the head of the canal where it diverts from the Umatilla River, there is a modern fish screen and bypass facility built in 1988 (**Figure 7**). Prior to that, a screen was in place dating back to the 1960's and earlier.

Figure 7. Fish screen at Three-Mile Falls Dam (OWRD website)



Personal communication with WEID and Oregon Department of Fish and Wildlife (ODFW) staff indicate that in 2002, a fish barrier (**Figure 8**) was installed near the end of the final overflow channel (**Figure 4**), 0.1 mile from its entrance to the Columbia River. Prior to this, fish were prevented from entering the drainage system by a large concrete irrigation box that blocked passage. This box was a part of the original irrigation system built in 1916. However, with the inundation of lands by the John Day Pool, irrigation ceased on these lower grounds. The box had deteriorated over the years and a few fish were noted above the Interstate-84 rest area (below the end of the concrete-lined portion). The 2002 fish barrier was installed as a safety measure to prevent fish from entering the canal system. The structure is described by the WEID Manager: "This is 1.5 miles downstream of our main canal. We had ODFW design the structure. The area

is limited by the two culverts - one under I-5 and one under the railroad tracks. There is a 4-foot elevation difference between the two culverts. So, our gate is set at a minimum three-foot height. The ramp (on the downstream side of the gate) falls an additional foot. Water sheets over the ramp typically, so fish are not able to swim upstream. We have never noticed fish coming up since we put this in. Landowners upstream from this area confirm."

Figure 8. Fish Barrier near end of canal overflow channel (2011 photo)
(Boardman Interstate-84 Rest Area is visible in background)



2.2 Canal History

The USBR built the Three-Mile Falls Diversion Dam in 1914. The WDMC was excavated, lined and completed in 1915-1916, via authorization by the USBR. The canal has been operated by the WEID since April 27, 1926. The original concrete-lined part of the canal is entirely human-made – it was not a natural waterbody and did not follow the course of a natural water body.

Congress, by the Act of September 6, 1966 (80 Stat. 707, Public Law 89-561) authorized the Secretary of the Interior to conduct a feasibility investigation to expand the area irrigation base and to address anadromous fishery needs. A proposed plan that included additional storage facilities was developed, however it was not authorized. Subsequently, through a cooperative local, State, Tribal (Confederated Tribes of the Umatilla Indian Reservation), and Federal effort the Columbia River water exchange plan was developed to help resolve fishery and irrigation water needs in the Umatilla River basin. The Umatilla Basin Project (Umatilla Basin Act of 1988) provides for an exchange of water for area irrigation, from the Columbia River instead of the Umatilla River. The Umatilla Basin Project has been heralded as the most successful stream flow restoration, salmon recovery and irrigation project in the Columbia River basin.

Authorized by Congress under the 1988 Umatilla Basin Act, the project re-engineered the water supplies for three of the four lower Umatilla Basin Irrigation Districts—Stanfield, Hermiston and West Extension Irrigation Districts. When the project was completed in the mid-1990s, those three Districts began taking their water from the Columbia River, rather than the Umatilla River, at ecologically-strategic times of year. Special regulations under Oregon’s water laws enabled an “exchange” of water supplies. This exchange is the basis for the alternating river sources for WDMC water.

The information source for this section and further documentation can be found at http://www.usbr.gov/projects/ImageServer?imgName=Doc_1305644113536.pdf, http://www.usbr.gov/projects/Project.jsp?proj_Name=Umatilla+Basin+Project, <http://oregonwatercoalition.org/blog/?p=86>.

Additional history is provided in **Section 2.1**, regarding fish barriers and flow management.

2.3 Canal Uses and Management

The canal is used for crop irrigation, including edible crops, and also provides for some livestock watering. Edible crops grown with the irrigation water include grain, fruit, and vegetables. Irrigated animal-feed plants include hay-pasture-alfalfa. The Irrigation District Manager describes the canal use as, "There is no hunting or boating. Farmers have livestock watering rights from the canal. Swimming or other human use of the canal is prohibited and is very hazardous. Gates are at most public access points of the canal to prevent unwanted vehicle access. Walking and horseback riding are allowed along the canal road. Industrial water supply does not occur. The water is used solely for irrigation and stock watering." Much of the irrigation occurs via center-pivot crop circles.

Management to exclude aquatic life. The WDMC is managed to exclude aquatic life in order to protect fish, which would likely not survive if they entered the canal, due to the absence of habitat and appropriate water quality conditions. As described earlier, fish barriers have been in place at both ends of the canal since the 1960's and earlier. In addition, the canal is maintained by routine application of aquatic pesticides, consistent with the District’s individual NPDES permit for pesticide application. Both Acrolein and copper sulfate are used in the WDMC to minimize nuisance aquatic weeds. These pesticides lead to toxic conditions for fish, one important reason that the District actively manages the canal to exclude fish from the system. The District has used Acrolein and copper sulfate in the canal since 1958. Finally, there are extended periods each year when large portions of the canal contain no flowing water.

Proximity to Human Population. As can be seen in **Figure 3** the canal passes through a rural agricultural landscape with some farmsteads and other rural residences. At only one point does the canal flow through a residential area – along the southwestern border of City of Umatilla (**Figure 9**). Here, vehicular access controls and warning signs are present, though physical restrictions do not entirely prevent entry (**Figure 10**). Beyond this, the canal landscape is entirely rural.

Swimming and boating are prohibited. No drinking water rights exist for the canal. Access to the canal is restricted at strategic locations via locked gates. There is limited access for walking and horseback riding.

Figure 9. WDMC adjacent to the City of Umatilla (NAIP, 2005)



Figure 10. View of Canal signage and access controls, from the canal bridge crossing at Umatilla, Oregon



2.4 Policy Background

Section 2.4.1 identifies policies and rules that are directly related to the proposed standards revision.

Section 2.4.2 provides background related to canal maintenance and permitting and the City's proposed discharge to the WDMC, and are not directly related to DEQ's proposed water quality standard revisions.

Rather, the proposed revisions are consistent with the City of Hermiston's planned discharge to the canal.

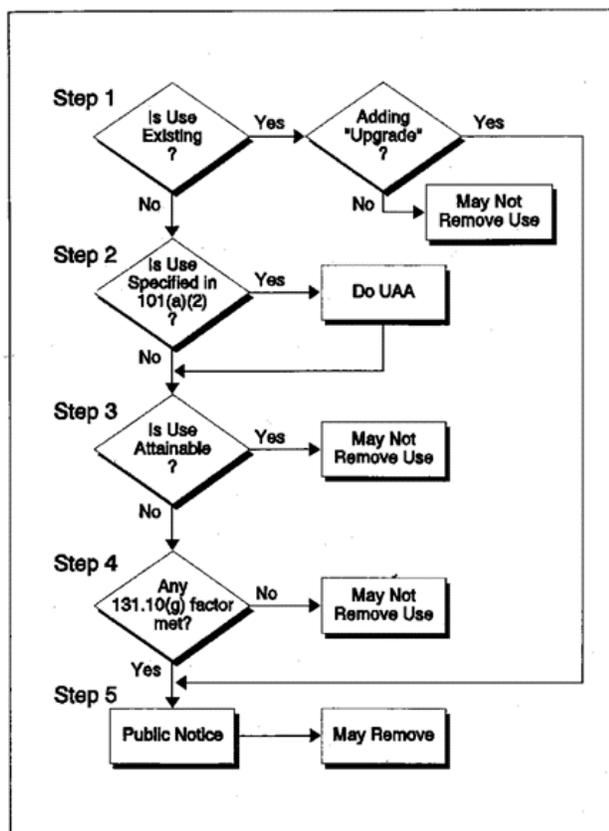
The **Section 2.4.2** background regarding the canal's NDPES permit and City's planned effluent treatment is included here as supplemental information.

2.4.1 Standards Revision

2.4.1.1 Use Change Guidance

State and Federal rules and guidelines identify considerations and requirements for changing designated beneficial uses in state water quality standards. These include Title 40 Code of Federal Regulations (CFR) 131.3 and 131.10 (the latter is included as **Appendix 8.2**), the 2007 DEQ *Use Attainability Analysis and Site-Specific Criteria Internal Management Directive*, and the EPA 1994 (with some 2007 updates) *Water Quality Standards Handbook* (second Ed.). The 1994 EPA handbook contains the following flow chart for changing designated uses (**Figure 11**) outlining the process DEQ is using in the proposed WDMC use revision.

Figure 11. Flow of logic in use change process (EPA 1994)



2.4.1.2 Changing Designated Uses – Requirements and Approach

States may remove designated beneficial uses that are not existing uses. States may not remove existing uses, as defined in 40 CFR 131.3, unless a use requiring more stringent criteria is added [40 CFR 131.10(h)(1)]. Existing uses are defined as "... those uses actually attained in the water body on or after November 28, 1975, whether or not they are included in the water quality standards." [40 CFR 131.3(e)]

Federal regulations (40 CFR 131.3(g)) state that a "Use attainability analysis is a structured scientific assessment of the factors affecting the attainment of the use which may include physical, chemical, biological, and economic factors as described in 40 CFR 131.10(g)." 40 CFR 131.10(j) specifies that a State must conduct a UAA as described in 40 CFR 131.3(g) whenever:

- The State designates or has designated uses that do not include the uses specified in section 101(a)(2) of the Act (Clean Water Act of 1972), or
- The State wishes to remove a designated use that is specified in section 101(a)(2) of the Act or to adopt subcategories of uses specified in section 101(a)(2) of the Act which require less stringent criteria. The uses in 101(a)(2) of the Act are "protection and propagation of fish, shellfish, and wildlife and provides for recreation in and on the water."

EPA regulations state that at a minimum, uses are deemed attainable if they can be achieved by the imposition of effluent limits required under sections 301(b) and 306 of the Act (point source controls) and cost-effective and reasonable best management practices (BMPs) for nonpoint source control (40 CFR 131.10(d)). At this point in time, there are no point source discharges to the canal. Should Hermiston relocate its WWTP discharge to the canal, DEQ will ensure that the applicable requirements are included in the NPDES permit.

In brief, existing uses and attainable uses are prohibited from being removed, and removal of the statutorily (CWA 101(a)(2)) identified uses requires a structured scientific analysis referred to as a use attainability analysis (UAA). These requirements relate to the WDMC standards revision as follows:

1. The Department is not removing existing uses from the use designation.
2. The Department is not removing attainable uses from the use designation. DEQ's conclusions in this regard are based on the artificial nature of the waterbody, its known use and the purpose for its construction and operation.
3. The Department is correcting an 'over-designation' of uses for the canal.
4. The Department proposes to remove uses related to aquatic life, which are designated uses in section 101(a)(2) of the Act, as these uses are inconsistent with the intended use, purpose and management of the canal, and are not existing or feasibly attainable uses. Other uses will be removed as well, as discussed in **Section 3**.
5. The Department is proposing revised uses for the WDMC that will require less stringent criteria.

This report constitutes a UAA. It is administratively focused and includes sufficient information as to whether uses are existing or attainable, given that the canal's operations, controls, purpose and artificial nature are straightforward and dictate the type of uses that are existing and attainable. The Department's UAA Internal Management Directive (DEQ, 2007) states "DEQ anticipates that there will be situations in which the UAA will not require all of the technical information described in this chapter [for a more exhaustive UAA]. This may be the case if: the designated use is not an existing use, the designated use is not necessary as a goal for the waterbody, the proposed changes to a designated use are corrections to the water quality standards..." All of these conditions are true for the WDMC. This use attainability analysis, as stated in item 2 above, is focused on the artificial nature of the canal and its known and intended use and operations. Discussions with EPA further indicate that the needed level and type of information for a use change should be commensurate with the type and degree of use change. For example, a use designation correction, as is being applied to the WDMC, is a different context from non-attainment based on unachievable water quality. As another example, more information should be required where there is

potential for highly sensitive uses, such as where waterbodies are natural, perennial and listed through the Endangered Species Act (ESA) – none of which are true for the WDMC.

EPA has stated that the definition of "existing use" can consider the available data and information on both the actual use and water quality. With regard to the canal, the relevant historic water quality data (1970's) are not available. EPA has indicated (EPA 2008) that in such circumstances, a state may choose "to determine an existing use based on the strength of evidence that a use has actually been achieved or the strength of evidence that water quality supporting a use has been achieved." The Department's analysis focuses on whether the use has actually occurred or may occur in the future in the absence of historic water quality data (during and after 1975). Beneficial uses focused on the protection of fish are an example. As described in **Section 3**, the canal screens are designed to protect fish by excluding them from the biologically harsh conditions of the canal (pumps, standing water, pesticide application, etc.) – to protect endangered fish populations.

In addition, EPA (2008) states "Where the water quality achieved was sufficient to support a use on or after November 28, 1975, but the use (i.e., some degree of use related to aquatic life, wildlife, and human activity) has not occurred, the federal regulations provide states and tribes the discretion to determine whether or not this is an existing use. In this case, however, it would be reasonable to presume the use is attainable and that a state or tribe would need to explain the factors unrelated to water quality (e.g., human caused conditions that cannot be remedied, hydrologic modifications) that are limiting the attainment of the use before it can be removed..." This explanation is provided in **Section 3**.

2.4.2 Related Policy

2.4.2.1 Canal Return Flow NPDES Exemption

In Oregon, the NPDES program administered by DEQ covers discharges to surface waters of the state, and surface waters of the state include irrigation canals. Discharges consisting of irrigation return flow and agricultural storm water are exempt from NPDES permitting requirements, however [Clean Water Act Section 402(1), 502(14)]. As such, irrigation return flow and agricultural stormwater flows into the WDMC and return flows from the WDMC to the Columbia River are exempt from NPDES permitting requirements. In addition, according to the Oregon Attorney General's Office, the NPDES-permitted discharge of treatment plant effluent by the City of Hermiston does not remove this exemption. "Simply put, the existence of permitted discharges to receiving water does not change the nature of the exempt discharges or the nature of the receiving water itself" [Oregon Department of Justice (DOJ), 2010].

2.4.2.2 Class A Waters

In Oregon, land application of recycled water, i.e., wastewater re-used for crops, may be applied to human-food crops that are eaten uncooked if it is first treated to "Class A" levels. Oregon Administrative rules (**OAR 340-055-0012**) define various classes of recycled water in terms of treatment levels and allowable uses. Class A waters may be used for irrigation for any agricultural or horticultural use. There are examples of Class A (or an equivalent treatment level) recycled water irrigation for food crops elsewhere in the US. Class A waters must be oxidized, filtered, disinfected, and must meet specified stringent numeric limits for total coliform bacteria and turbidity. Given the similarity between direct land application for growing crops and discharge to an irrigation system, the City of Hermiston is planning to treat their municipal wastewater to Class A standards. This exceeds the level of treatment generally needed to meet water quality standards for bacteria.

2.5 Authorities

The following entities have authority over various aspects of the canal, water quality standards and the Hermiston wastewater treatment plant.

- WEID: manages canal under a contract with the USBR
- City of Hermiston: the City is responsible for the WWTP and its discharge, and NPDES permit compliance
- USBR: The canal has a federal easement pursuant to the 1890 Reclamation Act. In addition, the irrigation project is owned by the USBR. Wastewater discharge to the canal requires a permit through the USBR in addition to the NPDES permit that DEQ administers for wastewater discharges to “waters of the state.” Preparation of the USBR permit is underway, and a draft National Environmental Policy Act Environmental Assessment has been completed.
- DEQ: Adopts and implements Oregon water quality standards; issues and enforces NPDES permits
- EPA: Approves water quality standards and oversees DEQ’s NPDES permits

3 Revision of Designated Uses for Canal

This section identifies the proposed changes to the WDMC designated beneficial uses and the rationale associated with the changes.

3.1 Geographic Scope of Standards Revision

This proposed water quality standards revision applies to the WDMC along its entire length including the canal overflow waters stemming from the downstream terminus of the original concrete structure. The canal is a single artery, except for the two overflow channels that exit the end of the main concrete canal and rejoin downstream. The proposed revised uses and criteria will apply to the entire waterbody, from the canal point of diversion to the point of confluence with the Columbia River. **Figure 3** illustrates the full waterbody (red line).

3.2 Historically Designated Beneficial Uses

Historically, DEQ designated uses by basin or subbasin. DEQ designated all, or nearly all, uses for every basin with only a few exceptions, such as commercial navigation and transportation where it was clearly not suitable. These designations did not represent a conclusion by DEQ or the Commission that every reach of every waterbody within each basin was suitable and should be protected for every use, including constructed canals. DEQ expects that the intent at that time was to assign uses broadly since the uses either existed or warranted protection in at least some if not most of the waters within the basin. The current designated uses for the Umatilla and Willow Creek Subbasins are listed in **Table 310A** (below) and adopted by reference in **OAR 340-041-0310**. While much of the canal lies between the Umatilla and Willow Subbasins (in the Mid Columbia – Lake Wallula drainage), DEQ interprets the Umatilla Subbasin column of **Table 310A** to include the WDMC as well.

Table 310A

**Designated Beneficial Uses
Umatilla Basin
(340-41-0310)**

Beneficial Uses	Umatilla Subbasin	Willow Creek Subbasin
Public Domestic Water Supply ¹	X	X
Private Domestic Water Supply ¹	X	X
Industrial Water Supply	X	X
Irrigation	X	X
Livestock Watering	X	X
Fish & Aquatic Life ²	X	X
Wildlife & Hunting	X	X
Fishing	X	X
Boating	X	X (at mouth)
Water Contact Recreation	X	X
Aesthetic Quality	X	X
Hydro Power	X	X
Commercial Navigation & Transportation		
¹ With adequate pretreatment (filtration & disinfection) and natural quality to meet drinking water standards.		
² See also Figures 310A and 310B for fish use designations for this basin.		

Table produced November, 2003

3.3 Existing Uses

DEQ evaluated the existing uses and concludes that the existing uses for the WDMC are limited to:

- irrigation
- livestock watering
- wildlife and hunting (as an aggregate category for limited waterfowl use, but hunting does not occur)
- infrequent water contact
- aesthetic quality

Irrigation, livestock watering, wildlife and infrequent water contact have been attained in the water body on and after November 28, 1975. Aesthetic qualities are present as well. The primary intended use and purpose of the canal is for irrigation. Canal water is also used for livestock watering. DEQ identified these

existing uses based on the knowledge and professional judgment of WEID, USBR, ODFW and DEQ staff with input from the public. The existing uses are consistent with the features and operations of the canal, the fact that it is a constructed canal (and was never a natural stream or waterbody), and the intent and purpose for its construction and operation.

Water contact (human) occurs infrequently, primarily for the purpose of canal and pump maintenance activities. Swimming is prohibited and public access to the canal is very, as described in **Section 3.6**. It is possible that some incidental water contact by children or other people could occur, particularly where the canal passes through a City of Umatilla residential area (**Section 2.3**) or in the overflow reaches.

Wildlife is an existing use primarily due to temporary presence of waterfowl. Hunting does not occur along the canal. However, for the sake of simplicity and potential future use, wildlife and hunting will continue to be designated as a use.

3.4 Historically Designated Beneficial Uses that are not Existing Uses

The WDMC designated beneficial uses, prior to this revision, that are not existing uses are:

- public domestic water supply
- private domestic water supply
- industrial water supply
- fish and aquatic life and the sub-category Redband or Lahontan Cutthroat Trout
- fishing
- boating
- hydropower

The canal has never been used for either public or private domestic water supply or industrial water supply. Irrigation canals are not used for domestic water supply and there are no water rights providing for such use, nor is it feasible that they would be granted. Therefore, these are not existing uses.

Fish and aquatic life is not an existing use. Fish screens and management measures to exclude aquatic life have been in place since well before 1975 and will be continued, as described in **Section 2.2**. **Appendix 8.3** is a letter from the ODFW Umatilla District Fish Biologist documenting that the canal does not have redband or Lahontan cutthroat trout and that the trout use designation is incorrect. While the letter addresses periods of 1988-2002 and later, the Irrigation District Manager has stated that earlier screens and fish barriers have been in place since the 1960's and earlier. Additional information on the canal structure and management as well as the fish screens is provided in **Chapter 2**. Fish screens notwithstanding, the artificial nature of the canal, its purpose and the adverse habitat it would provide – preclude aquatic life as an existing use. The canal is not a suitable environment for aquatic life, and the absence of suitable habitat for fish would likely lead to their mortality. Being a constructed, concrete-lined canal built for the purpose of conveying irrigation water, the canal lacks the necessary habitat elements of substrate, pools, refuge, shade, vegetation and stream flow that would be appropriate for fish and other aquatic life. These habitat elements are not an attainable condition for the WDMC, given that it is concrete-lined throughout the majority of its length. Further, the canal contains flowing water for only portions of the year, with large portions of the canal dry or void of flowing water for large periods of time each year. The flow in the canal is present for irrigation purposes and is diverted from the river under irrigation water rights. During the irrigation season when the canal is flowing, large amounts of water are pumped out of the canal for use in center pivot sprinkler irrigation systems, presenting a severe hazard to any aquatic life in the canal. Finally, pesticides are applied to the canal on a regular basis (consistent with the irrigation district's NPDES permit) to prevent the growth of aquatic plants and algae. This activity is also harmful to aquatic organisms (**Section 2.3**). Consequently, the canal conditions are inhospitable and often lethal for fish.

For reasons stated in the previous paragraph, and because there are no fish in the canal, fishing is not an existing use. The canal is not stocked and fishing is prohibited. In addition, public access is blocked for most of the canal's length.

Boating in the canal is prohibited and has not been allowed since the canal was constructed. Access along much of the canal is blocked, there are no boat ramps or “put-ins” and the fish barriers effectively prevent accidental entry. Hydraulic fluctuations, hazards and check dams combine to make boating inappropriate and unsafe. Much of the canal is too small for boating or has too little or no flow for large portions of each year. The canal was not designed or intended to be used for boating. Boating is not an existing use.

In addition, the canal has never been used for hydropower and is not configured for such. Hydropower is not an existing use.

3.5 Attainable Uses

The WDMC attainable uses are the existing uses (**Section 3.3**) and those that have potential to exist and be supported by the purpose, structure and management of the canal and feasibly attainable water quality. DEQ has determined that the attainable uses include:

- irrigation (existing use)
- livestock watering (existing use)
- wildlife and hunting (existing use)
- water contact recreation (limited existing use, infrequent and discouraged for safety purposes)
- aesthetic quality (existing use)
- industrial water supply
- hydropower

These uses are attainable under current conditions and/or those resulting from the imposition of point source controls and nonpoint source best management practices. The existing uses are by definition attainable at the level at which they currently exist or have existed since November 1975, according to the available information. Industrial water supply and hydropower uses do not require high water quality in comparison to the existing uses or the natural streams, such as the Umatilla and Columbia Rivers, from which the canal derives its water. DEQ believes that industrial supply and hydropower may be attainable from a water quality perspective, though it recognizes that there may be other physical and legal constraints.

When designated uses are removed, and particularly when the use removal leads to a change in the applicable water quality criteria, the highest attainable use must be identified. This may be specific to a particular pollutant or water quality indicator. The highest attainable uses for the WDMC are irrigation, livestock watering and water contact recreation (however infrequent and unlikely). Some pollutants will require more stringent criteria for one use, some for another. **Section 4** provides further discussion of the proposed water quality criteria for these uses.

3.6 Proposed Revision of Beneficial Uses

This section describes the designated uses to be removed. DEQ will retain all designated uses that the agency concludes are existing or attainable as described above. The uses DEQ proposes to remove are not existing uses and are not feasibly attainable. Within the context of a *use attainability analysis*, Federal regulations (40 CFR 131.10(g)) require that one of six feasibility conditions be met in order to remove a non-existing designated use. These are referred to here as *131.10(g) factors*, or simply *factors*. The text of 40 CFR 131.10(g) is included in this document as **Appendix 8.2**.

DEQ proposes to remove public domestic water supply, private domestic water supply, fish and aquatic life, fishing and boating as designated beneficial uses for the West Division Main Canal. The remaining designated beneficial uses will be retained. This proposed re-designated set of uses represents the suite of existing and feasibly attainable uses that are in keeping with the nature and purpose of this constructed canal. Because DEQ is proposing that the designated uses will be those that are attainable, the full list of proposed designated beneficial uses is the same as the attainable use list in **Section 3.5** (bulleted), and the proposed rule change (**Section 5, Table 310A**) reflects this as well.

3.6.1 Public and Private Domestic Water Supply

As described in **Section 3.4**, public and private domestic water supply are not existing uses and are not appropriate or attainable uses of the canal. DEQ proposes to remove these as designated uses of the canal. Federal regulations at 40 CFR 131.10 do not explicitly require a UAA to remove this use designation because domestic water supply is not a statutory goal under the CWA 101(a)(2). However, as described in **Section 3.4**, DEQ concludes that domestic water supply, both public and private, are not existing or attainable uses for the WDMC.

3.6.2 Fish and Aquatic Life

DEQ proposes to remove fish and aquatic life as a designated use of the WDMC. Fish and aquatic life is not an existing use and is not attainable as discussed in **Sections 3.3 and 3.4**.

Section 101(a)(2) of the CWA states that a goal of the Act is water quality that provides for the "protection and propagation of fish" as a designated use where attainable. Therefore, the State must conduct a UAA as described in 40 CFR 131.3(g) to evaluate the attainability of this use before it may be removed. This document serves as the UAA, as described in **Section 2.4.1**.

40 CFR 131.10 (g) Basis for removal. This federal regulation allows a state to remove a designated use that is not an existing use, or establish sub-categories of a use, if the state can demonstrate that attaining the designated use is not feasible for one of six reasons listed. Several of the use removal factors are relevant to the WDMC and DEQ's consideration of whether fish and aquatic life is an attainable use. Factor 4 is the primary factor relied upon for this action: "Dams, diversions or other types of hydrologic modifications preclude the attainment of the use, and it is not feasible to restore the water body to its original condition or to operate such modification in a way that would result in the attainment of the use..." The WDMC is itself a hydrologic modification, the source of its water is a hydrologic diversion, and fish passage barriers have been constructed to prevent fish from entering the canal. Because this is a manmade canal, the canal condition is the original condition of the waterbody, as is its operation for the purpose of conveying water and using that water for irrigation. Thus, it is not feasible to restore it to a condition that supports fish and aquatic life use. Factor 4 indicates that the presence of hydrologic diversions and other modifications are an acceptable basis for use non-attainment.

In addition, factor 5 also provides a rationale for non-attainment of fish and aquatic life. By its very nature, the canal does not provide appropriate fish habitat conditions, as discussed in **Section 3.4**.

3.6.3 Fishing

DEQ is proposing to remove fishing as a designated use for the canal. Fishing is not an existing (**Section 3.4**) or attainable use (**Section 3.5**).

Section 101(a)(2) of the CWA lists "recreation in and on the water" and fish protection as a goal of the Act. As fishing is intimately related to these uses, DEQ is addressing fishing through this UAA.

40 CFR 131.10 (g) Basis for removal. The rationale for removing fishing as a designated use is the same as the rationale described in **Section 3.6.2** above for removing fish and aquatic life.

3.6.4 Boating

The Department proposes to remove boating as designated use for the canal. Boating is not an existing or attainable use (**Section 3.4** and **Section 3.5**).

Section 101(a)(2) of the CWA lists "recreation in and on the water" as a goal of the Act and therefore, according to the federal regulations, the state must do a UAA to remove this use.

40 CFR 131.10 (g) Basis for removal. The factor that supports the removal of this use is factor 4, "dams, diversions or other types of hydrologic modifications preclude the attainment of the use, and it is not feasible to...operate such modification in a way that would result in the attainment of the use..." as explained in **Section 3.6.2**. Boating is not an attainable use for the same reasons that it is not an existing use, as described in **Section 3.4**.

3.7 Influence on Downstream Waters

The general rule for standards and their influence on downstream waters is in 40 CFR 131.10(b): "In designating uses of a water body and the appropriate criteria for those uses, the State shall take into consideration the water quality standards of downstream waters and shall ensure that its water quality standards provide for the attainment and maintenance of the water quality standards of downstream waters."

The WDMC overflow enters the Columbia River throughout much of the time the canal operates, which is generally limited to March 1 through October 31. The WDMC overflow entering the Columbia River is typically 0.5-6 CFS, but can range from zero to 30 CFS, as stated previously, and even in the off-season runs from 0.5 to 6 CFS due to groundwater input. The Columbia River at The Dalles Dam flows at 120,000 CFS during low flow years. This resulting relative flow proportion (Columbia River compared to Canal) ranges from 4,000:1 to 40,000:1 (based on 30 and 3 CFS, respectively) during a low flow year for the Columbia River.

The influence of WDMC water on the Columbia is minimal, based on the canal's relatively slight volume of flow entering the Columbia River.

Based on this fact, the proposed revisions to the standards applicable to the WDMC will not affect the water quality of the Columbia River and as such, are sufficient to provide for the attainment and maintenance of the downstream waters.

4 Proposed Criteria Revisions

DEQ is proposing revised water quality criteria to protect the revised WDMC designated uses.

4.1 Proposed Criteria

Criteria that no longer apply. Because domestic water supply, fish and aquatic life, and fishing are being removed as designated uses for the canal, the prior water quality criteria associated with these uses will no longer apply to the canal including:

- toxics criteria for aquatic life and human health contained in OAR 340-041-0033;
- dissolved oxygen;
- temperature;
- pH;
- turbidity and others.

The existing dissolved oxygen, temperature, pH and turbidity criteria are designed to protect aquatic life. Some of these criteria will be replaced by numeric or narrative criteria established to protect the new uses, as described below.

Proposed and existing numeric criteria. Because DEQ is removing aquatic life and drinking water uses, which are typically the most sensitive uses, irrigation, livestock watering and water contact recreation now become the most sensitive uses for the canal as described in **Section 3.5**. The existing bacteria criteria established to protect water contact recreation will continue to apply to the canal. DEQ is proposing site-specific numeric criteria for the canal to protect irrigation and livestock watering as shown in **Table 2**. The basis for these criteria is discussed in **Section 4.2**. No criteria for temperature or dissolved oxygen will be established because the irrigation and livestock watering uses are not sensitive to these parameters at levels that would reasonably be expected to occur in the canal. Turbidity criteria will be replaced with a narrative criteria addressing sediment and particle size intended to protect the operation of irrigation systems. The proposed criterion in **Table 2** include pH and total dissolved solids as well as metals and other constituents.

Proposed and existing narrative criteria. Oregon's water quality standards include some criteria that are context dependent, such as the statewide narrative criteria in 340-041-0007. These general narratives will continue to apply where relevant to ensure the designated uses for the WDMC (and the downstream uses, where relevant) are protected. In addition, WDMC-specific narrative criteria are proposed for toxics and sediment as part of this standards revision. **Section 5** contains the proposed narrative criteria (**OAR 340-041-0315**).

Table 2. Proposed Criteria for Agricultural Water Uses (a)

Parameter	Irrigation (mg/l unless noted)	Livestock Watering (mg/l)
pH	4.5 to 9.0 standard units (b)	
Total Dissolved Solids	750 (c)	
Aluminum	5	5
Arsenic (inorganic)	0.1	0.2
Beryllium	0.1	
Boron	0.075	5
Cadmium	0.01	0.05
Chromium	0.1	1
Cobalt	0.05	
Copper	0.2	0.5
Fluorides	1	2
Iron	5	
Lead	5	0.1
Lithium	2.5	
Manganese	0.2	
Mercury		0.01
Molybdenum	0.01	
Nickel	0.2	
nitrite (as N)		10
Selenium	0.02	0.05
vanadium	0.1	0.1
Zinc	2	25

Table Notes and References:

(a) Values from EPA 1973, Water Quality Criteria 1972 (the "Blue Book").

(b) Not an EPA criteria recommendation, but water in this range should be usable (EPA 1973).

(c) Not an EPA criteria recommendation, but general information on effects at various ranges of TDS is provided (EPA 1973, EPA 1986).

4.2 Basis for Proposed Criteria

4.2.1 Numeric Criteria

The proposed irrigation and livestock watering criteria shown in **Table 2** and in the proposed rule (**Section 5**) are EPA recommended criteria or are EPA informational values, in the case of pH and TDS (EPA, 1973; EPA, 1986). There is a lengthy discussion of agricultural water uses in the "Blue Book" (EPA, 1973); these constitute the most recent recommendations from EPA.

Salinity. Salinity is one of the primary water quality concerns for irrigation use of water in arid or semi-arid areas. The Hermiston-Boardman area is relatively arid, typically receiving less than ten inches of rain per year. In such regions, EPA concludes that irrigation water containing total dissolved solids (TDS) of 500 mg/l will usually result in no detrimental effect, and that waters with 500 to 1000 mg/l dissolved solids can have detrimental effects on sensitive crops. However, EPA qualifies this as only a suggested guideline: "In spite of the facts that (1) any TDS limits used in classifying the salinity hazard of waters are somewhat arbitrary; (2) the hazard is related not only to TDS but also to the individual ions involved; and (3) no exact hazard can be assessed unless the soil, crop, and acceptable yield reductions are known, Table V-11

suggests classifications for general purposes for arid and semiarid regions" (EPA 1973, referenced table inset below). The impacts of total dissolved solids on irrigation water use depend on several factors, including crop type, soil characteristics, local climate, the specific ions present and irrigation water management.

TABLE V-11—Recommended Guidelines for Salinity in Irrigation Water

Classification	TDS mg/l	EC mmhos/cm
Water for which no detrimental effects are usually noticed	500	0.75
Water that can have detrimental effects on sensitive crops	500-1,000	0.75-1.50
Water that can have adverse effects on many crops; requires careful management practices	1,000-2,000	1.50-3.00
Water that can be used for tolerant plants on permeable soils with careful management practices	2,000-5,000	3.00-7.50

There is no TDS criterion applicable to other water bodies in the Umatilla Basin. TDS criteria in other Oregon basins vary widely. A TDS criterion of 750 mg/l applies to the Snake River, which is also an important source of irrigation water in the region. Given the uncertainty in determining levels of concern, DEQ is reluctant to specify the most stringent value in Table V-11 (500 mg/l), as numeric criteria for TDS for the WDMC. DEQ proposes 750 mg/l, the mid-range for the suggested classification of 'water that can have detrimental effects on sensitive crops' as the criterion for the WDMC. This is consistent with other relevant scientific literature. *Managing Irrigation Water Quality for Crop Production in the Pacific Northwest* (PNW 2007), *Water Quality Indicators Tools* (NRCS 2000) and *Agricultural Waste Management Field Handbook* (NRCS 1997)), which provide similar ranges of potential affects. The Blue Book indicates that thresholds protecting livestock watering are much higher – when soluble salts below 3000 mg/l, detrimental effects are not observed.

Bacteria. The presence of bacteria or other pathogens is another potential concern for water used to irrigate food crops. EPA (1973) concludes that irrigation waters below a fecal coliform density of 1000/100 ml should result in no hazard to animals or man either from the use of the water or the consumption of raw crops that have been irrigated with the water (p.351). EPA revised its bacteria criteria recommendations for recreational uses in 1986, but did not change the information for irrigation use. DEQ is proposing to retain the current designated use for water contact recreation and the associated criteria (**Sections 3.3 and 3.6**). The existing criteria, which are more stringent than the 1000/100 ml fecal coliform value, ensure that the irrigation and livestock watering uses are also protected.

4.2.2 Narrative Criteria

Narrative criteria can be particularly important where concerns are identified but numeric criteria have not been established. They can provide a basis for addressing information gaps when new information becomes available.

The proposed narrative criterion for toxic substances augments the numeric criteria of **Section 4.1**. The narrative will allow DEQ to regulate the discharge of additional toxic pollutants should we obtain information indicating that those pollutant may adversely impact a designated use of the canal. The proposed narrative criterion for sedimentation addresses irrigation, where excess fines or large particles can be mobilized into pumps and cause problems with the irrigation equipment or premature wear.

4.2.3 Other States

DEQ also evaluated other states' approaches to establishing water quality criteria for agriculture-related uses in identifying the appropriate criteria for the revised WDMC designated uses. While DEQ did not directly use the other states' values, this information is provided here for reference.

Idaho relies on general water quality criteria narratives but refers to Water Quality Criteria 1972 (Blue Book) section V where more specificity is necessary to protect the use (Idaho Administrative Code, IDAPA 58.01.02).

Washington does not use numeric criteria; rather, it relies on two narrative criteria for agricultural water uses (Washington Administrative Code 173-201A-200):

1. toxic, radioactive or deleterious materials must be below levels that have the potential to adversely affect uses; and
2. aesthetic values must not be impaired.

California's Central Valley basin plan (Central Valley Regional Water Quality Control Board, 2009) includes only electrical conductivity criteria for agricultural uses. The conductivity targets are specific to place and date. The discussion in the basin plan is more about the impacts of agriculture on water quality rather than on criteria to protect irrigated agricultural use of water.

Alaska uses EPA's Blue Book criteria (EPA, 1973) for its irrigation-designated use and the Green Book criteria (FWPCA, 1968) for its livestock watering designated use (Alaska Administrative Code, 2011). Because the Blue Book is more recent, DEQ proposes to use the Blue Book criteria for both of these agricultural water uses.

5 Text of Proposed Rule Change

Department of Environmental Quality

Water Pollution

Division 41

Water Quality Standards: Beneficial Uses, Policies and Criteria for Oregon

Basin-Specific Criteria (Umatilla)

340-041-0310

Beneficial Uses to Be Protected in the Umatilla Basin

(1) Water quality in the Umatilla Basin (see Figure 1) must be managed to protect the designated beneficial uses shown in Table 310A (~~November 2003~~ [February 2012](#)).

(2) Designated fish uses to be protected in the Umatilla Basin are shown in Figures 310A and 310B (November 2003).

Stat. Auth.: ORS 468.020, 468B.030, 468B.035 & 468B.048

Stats. Implemented: ORS 468B.030, 468B.035 & 468B.048

Hist.: DEQ 17-2003, f. & cert. ef. 12-9-03

340-041-0315

Water Quality Standards and Policies for this Basin

(1) pH (hydrogen ion concentration). pH values may not fall outside the following range: all Basin streams (other than main stem Columbia River [and the West Division Main Canal](#)): 6.5-9.0. When greater than 25 percent of ambient measurements taken between June and September are greater than pH 8.7, and as resources are available according to priorities set by the Department, the Department will determine whether the values higher than 8.7 are anthropogenic or natural in origin.

[\(2\) The following criteria apply to the West Division Main Canal and supersede the water quality standards in OAR 340-041-0011 through 340-041-0036:](#)

(a) The numeric criteria shown in Table 310B:

(b) Toxic substances may not be introduced to the canal in amounts, concentrations or combinations that are likely to harm the designated beneficial uses of the canal; and

(c) Sediment load and particulate size shall not exceed levels that interfere with irrigation or the other designated beneficial uses of the canal.

(23) Minimum Design Criteria for Treatment and control of Sewage Wastes in this Basin:

(a) During periods of low stream flows (approximately April 1 to October 31): Treatment resulting in monthly average effluent concentrations not to exceed 20 mg/l of BOD and 20 mg/l of SS or equivalent control;

(b) During the period of high stream flows (approximately November 1 to April 30): A minimum of secondary treatment or equivalent control and unless otherwise specifically authorized by the Department, operation of all waste treatment and control facilities at maximum practicable efficiency and effectiveness so as to minimize waste discharges to public waters.

Stat. Auth.: ORS 468.020, 468B.030, 468B.035 & 468B.048

Stats. Implemented: ORS 468B.030, 468B.035 & 468B.048

Hist.: DEQ 17-2003, f. & cert. ef. 12-9-03; DEQ 2-2007, f. & cert. ef. 3-15-07

Table 310A

**Designated Beneficial Uses
Umatilla Basin
(340-41-0310)**

Beneficial Uses	Umatilla Subbasin	Willow Creek Subbasin	<u>West Division Main Canal</u> ³
Public Domestic Water Supply ¹	X	X	
Private Domestic Water Supply ¹	X	X	
Industrial Water Supply	X	X	X
Irrigation	X	X	X
Livestock Watering	X	X	X
Fish & Aquatic Life ²	X	X	
Wildlife & Hunting	X	X	X
Fishing	X	X	
Boating	X	X (at mouth)	
Water Contact Recreation	X	X	X
Aesthetic Quality	X	X	X
Hydro Power	X	X	X
Commercial Navigation & Transportation			
¹ With adequate pretreatment (filtration & disinfection) and natural quality to meet drinking water standards.			
² See also Figures 310A and 310B for fish use designations for this basin. <u>Note: There is no fish & aquatic life use in the West Division Mail Canal. This table supersedes Figure 310A, which shows redband trout in the canal, but is updated with this rulemaking.</u>			
³ <u>The West Division Main Canal extends from the point of diversion from the Umatilla River to the confluence with the Columbia River, including the lined portion of the canal and the unlined overflow channels at the tail end of the canal.</u>			

Table produced November, 2003 revised February, 2012

Table 310B

Water Quality Criteria
West Division Main Canal, Umatilla Basin
(340-41-0310)

<u>Parameter</u>	<u>For Irrigation</u> <u>(mg/l unless noted)</u>	<u>For Livestock Watering</u> <u>(mg/l)</u>
pH	4.5 to 9.0 standard units	
Total dissolved solids	750	
Aluminum	5	5
Arsenic (inorganic)	0.1	0.2
Beryllium	0.1	
Boron	0.075	5
Cadmium	0.01	0.05
Chromium	0.1	1
Cobalt	0.05	
Copper	0.2	0.5
Fluorides	1	2
Iron	5	
Lead	5	0.1
Lithium	2.5	
Manganese	0.2	
Mercury		0.01
Molybdenum	0.01	
Nickel	0.2	
nitrite alone		10
Selenium	0.02	0.05
vanadium	0.1	0.1
Zinc	2	25

6 Public & Stakeholder Participation

During the development phase, DEQ reached out to the City of Hermiston, the agricultural community, the environmental community, federal regulators, Tribes, the Governor's Regional Solutions team for the area and various State Agencies.

City of Hermiston. DEQ staff have attended a City Council meeting and met with the Hermiston City Manager and their consultants on numerous occasions.

Environmental Community. DEQ convened a roundtable discussion in June 2011 to discuss the WDMC effort and several other water quality standards revisions underway. No objections were raised with regard to the WDMC standards revision and the Department invited ongoing involvement. Representatives of the Oregon Environmental Council, Sierra Club and Tualatin Riverkeepers were present. Invited parties included these organizations and the Columbia Riverkeeper, Northwest Environmental Advocates, Northwest Environmental Defense Center, and Freshwater Trust.

US EPA. Discussions with EPA staff and managers, and resources provided by them, substantially informed the development of this standards revision text. DEQ has worked to ensure the analysis and conclusion contained within this document are consistent with EPA rules and guidance.

Irrigation Community. DEQ has corresponded with USBR offices and the Irrigation District. The District was particularly helpful in describing the canal setting and operations. DEQ staff have discussed the proposed action with Oregon Department of Agriculture's watershed management team lead in Salem as well.

Tribes. The Confederated Tribes of the Umatilla Indian Reservation (CTUIR) are a major stakeholder group. Their dedicated efforts have been key to salmon re-introduction, river flow restoration and habitat protection and recovery in the Umatilla Basin. DEQ staff have discussed the WDMC standards revision with CTUIR's Environmental Protection and Rights Preservation Manager, who was provided a draft copy of this document for input.

State Agencies. DEQ staff have discussed the project with, and recruited input from Oregon Departments of Water Resources, Fish and Wildlife and Agriculture. Each provided helpful input.

In preparation for the formal public comment period, planned for October 1-November 15, 2011, DEQ will notify the statewide lists of interested parties for water quality standards and TMDLs and encourage input from EPA, National Marine Fisheries Service, US Fish and Wildlife Service, Umatilla and Morrow County Commissioners, Umatilla Basin Watershed Council, Umatilla Soil and Water Conservation District and all interested parties. This process will include media outreach and at least one public hearing in Hermiston.

Substantial related outreach has been carried out by the City of Hermiston, who has been evaluating various discharge scenarios and assessing the possibility of discharge to WDMC for several years. While the topic of the standards revision document is the focus here, the related topic of NPDES discharge to the canal has been instrumental in bringing public attention to both efforts. The City's outreach efforts have included a great deal of public education and media coverage and involvement of the irrigation community. **Table 3** summarizes these efforts.

Table 3. Summary of City of Hermiston outreach in assessing WDMC discharge alternative

Hermiston Recycled Water Plant Project Public Outreach Timeline				
	<u>Outreach Activity</u>	<u>Topic</u>	<u>Attendees</u>	<u>Date</u>
2008	Hermiston City Council Meeting	Project Status Update	Council, Public Meeting, Print Media	3/24/2008
	West Extension Irrigation District Meeting	Project Concept	WEID Manager and Water User	7/16/2008
	Discharge Stakeholder Meeting	On-site Review of Project with Stakeholders	DEQ, NMFS, USBR, ODF&W, LGW	7/23/2008
	Oregon Water Resources Congress Talk	Project Concept	Oregon Irrigation District Managers and Staff	10/23/2008
	Hermiston City Council Meeting	Project Status Update	Council, Public Meeting, Print Media	12/8/2008
2009	Hermiston City Council Meeting	Project Status Update	Council, Public Meeting, Print Media	3/9/2009
	Hermiston City Council Meeting	Project Status Update	Council, Public Meeting, Print Media	5/11/2009
	Confederated Tribes of the Umatilla Indian Reservation Meeting	Project Concept	CTUIR Water Quality and Water Resources staff	5/28/2009
	Hermiston City Council Meeting	Project Status Update	Council, Public Meeting, Print Media	12/11/2009
2010	West Extension Irrigation District Meeting	Project Informational Meeting	WEID Board and Manager	2/10/2010
	West Extension Irrigation District Meeting	Project Informational Meeting	Annual Water Users meeting	3/31/2010
	East Oregonian Article	EOJuly 1 10	General Public	7/1/2010
	Hermiston City Council Meeting	Project Status Update	Council, Public Meeting, Print Media	7/10/2010
	East Oregonian Article	EOJuly 15 11	General Public	7/15/2010
	Hermiston Herald Article	HHJuly 17 10	General Public	7/17/2010
	Hermiston Herald Article	HHJuly 31 10	General Public	7/31/2010
	East Oregonian Article	EOSept 11 10	General Public	9/11/2010
	West Extension Irrigation District Meeting	Project Informational Meeting	WEID Board and Manager	9/16/2010
	Hermiston Herald Article	HHNNovember 16 10	General Public	9/16/2010
2011	Hermiston Herald Article	HHJanuary 7 11	General Public	1/7/2011
	Hermiston Herald Article	HHJanuary 26-11	General Public	1/26/2011
	Hermiston Herald Article	HHJanuary 28 11	General Public	1/28/2011
	Hermiston Herald Article	HH OPED February 25 11	General Public	2/25/2011
	Hermiston City Council Meeting	Project Status Update	Council, Public Meeting, Print Media	4/11/2011
	Hermiston City Council Meeting	Recycled Water Risk Assessment and SB 737 Update	Council, Public Meeting, Print Media	6/13/2011
	East Oregonian Article	EOJune 18 11	General Public	6/18/2011
	Hermiston Herald Article	HH June 18 11	General Public	6/18/2011
	Hermiston Herald Article	HH OPED June 22 11	General Public	6/22/2011

7 References

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- DOJ (2010). Hermiston Recycled Water Discharge – Question and Brief Answer. Letter from Assistant Attorney General Larry Knudsen, Oregon Department of Justice, to Heidi Williams, DEQ Easter Region Water Quality Program.
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- FWPCA (1968). Water Quality Criteria. (the "**Green Book**"). Federal Water Pollution Control Administration. 800R68900.
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- NRCS (1997). Agricultural Waste Management Field Handbook, in National Engineering Handbook. US Department of Agriculture Natural Resource Conservation Service e-Directives. H 210 NEH 651.
- Washington Administrative Code 173-201A-200: Freshwater designated uses and criteria.
- Various websites discuss the canal and the Umatilla Basin project:
http://www.usbr.gov/projects/ImageServer?imgName=Doc_1305644113536.pdf,
http://www.usbr.gov/projects/Project.jsp?proj_Name=Umatilla+Basin+Project,
<http://oregonwatercoalition.org/blog/?p=86>.

8 Appendices

8.1 City of Hermiston Waste Water Treatment Plant and Planning

The City's WWTP operates under an individual-facility NPDES permit. The WWTP has been permitted to discharge to the Umatilla River year round dating back to the inception of DEQ's NPDES program. In addition, the NPDES permit covers land application to LGW Ranch fields, across the river (west) of the treatment plant. Land application provides an alternative discharge path that has been used when needed. In 1998-2000, during Total Maximum Daily Load (TMDL) development for the Umatilla Basin, intensified monitoring revealed ammonia problems in the Umatilla River, below the treatment plant, at times when Hermiston WWTP effluent entered the River. Stream temperatures in excess of standards were measured throughout much of the Umatilla Basin, accumulating downstream and exacerbated by low assimilative capacity due to irrigation withdrawals. Other parameters were addressed in the TMDL as well. The TMDL was established in 2001, with waste load allocations for the City of Hermiston WWTP for temperature, ammonia, E. coli and total suspended solids.

The NPDES permit re-issuance that followed TMDL establishment included effluent limits for these parameters, and it has been challenging to maintain compliance. In recent years, the City has determined that the optimal approach would be to discharge wastewater to the WDMC during the growing season and continue to discharge to the Umatilla River during November through early to mid-March. This would provide ecological benefits. It would entirely remove the effluent pollutants from the lower Umatilla River during the warm season when instream flow is lowest, and provide for in-canal attenuation and uptake of pollutants prior to returning to a natural waterbody, the Columbia River. Through the 27-mile course of the canal, we would expect thermal relaxation, and treatment and removal for various pollutants as well as substantial reduction in pollutant concentration due to mixing with the canal's river source-water prior to irrigation.

To date, the treatment plant remains permitted for its traditional discharge scenarios. The current NPDES permit was issued September 24, 2007 and is slated to expire in August 31, 2012. The City has evaluated various alternatives for sustainable, affordable and effective operations. There are few land application sites within an affordable pumping distance, and these have not proven suitable in land area and accessibility. Moreover, another reason single-owner farms are not feasible is that they typically do not irrigate much in April and October. The City would need to find another discharge alternative for the shoulder seasons if they were land applying recycled water to a single owner farm. Subsurface discharge to ground water and to the river was evaluated, as was direct discharge to the Columbia River. Dilution with groundwater and aquifer recharge has been considered. The City has assessed and discarded these various considerations in favor of the canal alternative.

In order to meet water quality and technology based standards prior to discharge to the canal, the City plans to upgrade the treatment plant to include a membrane bioreactor (MBR), resulting in treatment to the highest quality recycled water standards available (Class A). This is undertaken in part to address potential concerns of the irrigation community and their customers, and may lessen permitting concerns as well, for DEQ and USBR. USBR is requiring a permit of the City to authorize discharge of wastewater to the canal. The USBR permit generally defers water quality specifications to DEQ.

DEQ apprised the City that water in the canal constitutes waters of the state and that discharge to the canal would require a NPDES permit. The City, recognizing that the canal water quality standards are nearly as stringent as the Umatilla River, asked DEQ to re-evaluate its standards. This ultimately has led to this revision of the canal standards.

Currently the City's dry weather design flow at full capacity is approximately 4.5 CFS. Currently the outfall for direct discharge is located at the confluence of the North Hermiston Drain and the Umatilla River, at Umatilla River mile 5. The WDMC, as discussed elsewhere in this text, diverts from the River downstream at river mile 3. The planned discharge to the canal would be conveyed under the river through an existing pipeline, and then be extended via a new pipeline downstream to the canal just below the fish bypass structure at the Three Mile Falls Dam diversion.

In addition to TMDL concerns, other pollutant/indicators have been assessed in terms of attainability of water quality standards in the Umatilla River. This list (**Table 4**) provides a starting point for considering potential canal issues as well. The list was derived by combining past concerns (discharge to Umatilla River) and potential concerns associated with recent standards revision and rulemaking in relation to metals and other toxics.

Table 4. List of pollutants and water quality indicators of potential concern for Hermiston WWTP discharge to the Umatilla River

Parameters of Potential Concern
Temperature
pH
Biological Oxygen Demand
Dissolved Oxygen
Turbidity
Total Suspended Solids
Ammonia
Nitrate
Chlorine
<i>E. coli</i>
Arsenic
Copper
Manganese
Nickel
Zinc
Beta-Sitosterol
Chloroform
Cyanide
Toluene

Ultimately, when the NPDES permit is issued for discharge to the WDMC, we expect that a dilution waiver will be required to address minimum dilution for biological oxygen demand [OAR 340-041-0007 (16)(a)(A)(i)]. The discharge would meet applicable criteria at end of pipe, due to lack of in-canal dilution at times when the Umatilla River supply to the canal is unavailable. When Umatilla River water is not supplying the canal, the planned WWTP outfall location would have little or no receiving water with sufficient flow for mixing. This occurs at some point, usually during June or July, when the canal supply is switched to the Columbia River input roughly 2-2.5 miles down-canal from the planned outfall location.

8.2 Code of Federal Regulations 130.10, Title 40

Section 131.10 Designation of uses.

(a) Each State must specify appropriate water uses to be achieved and protected. The classification of the waters of the State must take into consideration the use and value of water for public water supplies, protection and propagation of fish, shellfish and wildlife, recreation in and on the water, agricultural, industrial, and other purposes including navigation. In no case shall a State adopt waste transport or waste assimilation as a designated use for any waters of the United States.

(b) In designating uses of a water body and the appropriate criteria for those uses, the State shall take into consideration the water quality standards of downstream waters and shall ensure that its water quality standards provide for the attainment and maintenance of the water quality standards of downstream waters

(c) States may adopt sub-categories of a use and set the appropriate criteria to reflect varying needs of such sub-categories of uses, for instance, to differentiate between cold water and warm water fisheries.

(d) At a minimum, uses are deemed attainable if they can be achieved by the imposition of effluent limits required under sections 301(b) and 306 of the Act and cost-effective and reasonable best management practices for nonpoint source control.

(e) Prior to adding or removing any use, or establishing sub-categories of a use, the State shall provide notice and an opportunity for a public hearing under Sec. 131.20(b) of this regulation.

(f) States may adopt seasonal uses as an alternative to reclassifying a water body or segment thereof to uses requiring less stringent water quality criteria. If seasonal uses are adopted, water quality criteria should be adjusted to reflect the seasonal uses, however, such criteria shall not preclude the attainment and maintenance of a more protective use in another season.

(g) States may remove a designated use which is not an existing use, as defined in Sec. 131.3, or establish sub-categories of a use if the State can demonstrate that attaining the designated use is not feasible because:

- (1) Naturally occurring pollutant concentrations prevent the attainment of the use; or
- (2) Natural, ephemeral, intermittent or low flow conditions or water levels prevent the attainment of the use, unless these conditions may be compensated for by the discharge of sufficient volume of effluent discharges without violating State water conservation requirements to enable uses to be met; or
- (3) Human caused conditions or sources of pollution prevent the attainment of the use and cannot be remedied or would cause more environmental damage to correct than to leave in place; or
- (4) Dams, diversions or other types of hydrologic modifications preclude the attainment of the use, and it is not feasible to restore the water body to its original condition or to operate such modification in a way that would result in the attainment of the use; or
- (5) Physical conditions related to the natural features of the water body, such as the lack of a proper substrate, cover, flow, depth, pools, riffles, and the like, unrelated to water quality, preclude attainment of aquatic life protection uses; or
- (6) Controls more stringent than those required by sections 301(b) and 306 of the Act would result in substantial and widespread economic and social impact.

(h) States may not remove designated uses if:

- (1) They are existing uses, as defined in Sec. 131.3, unless a use requiring more stringent criteria is added; or
- (2) Such uses will be attained by implementing effluent limits required under sections 301(b) and 306 of the Act and by implementing cost-effective and reasonable best management practices for nonpoint source control.

(i) Where existing water quality standards specify designated uses less than those which are presently being attained, the State shall revise its standards to reflect the uses actually being attained.

(j) A State must conduct a use attainability analysis as described in Sec. 131.3(g) whenever:

- (1) The State designates or has designated uses that do not include the uses specified in section 101(a)(2) of the Act, or
- (2) The State wishes to remove a designated use that is specified in section 101(a)(2) of the Act or to adopt subcategories of uses specified in section 101(a)(2) of the Act which require less stringent criteria.

(k) A State is not required to conduct a use attainability analysis under this regulation whenever designating uses which include those specified in section 101(a)(2) of the Act.

8.3 Fish Screen Correspondence, ODFW to DEQ

	<h1>Oregon</h1>	<p>Department of Fish and Wildlife John Day Watershed District Office 73471 Mytinger Lane Pendleton, OR 97801 541-276-2344 FAX 541-276-4414</p>
<p>Theodore R. Kulongoski, Governor</p>		
<p>March 9, 2009</p>	<p>Jennifer Wigal Water Quality Standards and Assessment Manager Oregon Department of Environmental Quality 811 Sixth Avenue Portland, Or 97204-1390</p>	<p>DFW MAR 12 2009 Water Quality</p>
<p>RE: Fish Use Designation of the West Extension Irrigation Canal, Umatilla County</p>		
<p>The status of fish use in the West Extension Irrigation canal has come under question as the City of Hermiston is in the design phase to upgrade its wastewater treatment facilities. One of the proposed options would discharge treated wastewater into the irrigation canal system. The current Oregon Department of Environmental Quality fish use designation map for the Umatilla Basin (figure 310A) identifies the West Extension Irrigation Canal as having Redband or Lahontan cutthroat trout use. After review ODFW has determined the West Extension Irrigation Canal system has been incorrectly designated as having Redband or Lahontan cutthroat trout use.</p>		
<p>The Irrigation canal system was constructed by the Bureau of Reclamation in 1916. Water is diverted from the Umatilla River into the irrigation canal system at Three mile Falls Dam during the irrigation season (March 1 to October 31). Before 1988 there was the possibility of fish being diverted into the canal, however, in the fall of 1988 a fish screen and bypass facilities were constructed at the canal diversion point to prevent fish from entering the irrigation canal system. On the downstream end of the canal system excess water returned to the Columbia River and provided a potential route for fish to enter the lower end of the canal system. To prevent entry of fish at the lower end of the canal system in 2002 a fish barrier was constructed at the canal tailwater wasteway located approximately one mile West of Boardman. The construction of these two facilities means that fish can no long enter the West Extension Irrigation Canal systems and ODFW does not consider the canal system as having Redband or Lahontan cutthroat trout use.</p>		
<p>Please feel free to contact me at 541-276-2344 if you have any questions.</p>		
		
<p>Bill Duke Umatilla District Fish Biologist</p>		
<p>Cc: Debra Sturdevant, DEQ Kevin Blakely, ODFW Bev Bridgewater, West Extension Irrigation District</p>		



State of Oregon
Department of
Environmental
Quality