City of Medford RWRF Proposed NPDES Permit Amendments to Fact Sheet (Evaluation Report)

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Background

DEQ is proposing to renew the National Pollutant Discharge Elimination System for the City of Medford Regional Wastewater Reclamation Facility (RWRF). The draft permit, fact sheet (evaluation report), and Thermal Credit Trading Program were made available for public comment from October 13, 2011 through November 25, 2011. A public hearing was held on November 16, 2011.

All comments were reviewed and, where appropriate, DEQ has revised the draft permit, as discussed in the response to comments memo. Comments regarding the fact sheet (evaluation report) are addressed in this errata sheet, which will be attached to the final fact sheet. Comments that did not result in changes to the documents are also addressed in the response to comments memo.

Section 2 Facility Description

Page 4, Section 2.3 Outfalls. The following sentence is added: "Outfall 001a is connected to the dechlorination channel via a weir and a mechanical valve."

Page 5, Paragraph 1, last sentence: The last paragraph is changed as follows:

"Figure 4-4, p. 2, above shows that the average dry weather flow remained below 20 million gallons per day (MGD) during the last seven years. The highest average dry weather flow was in 16.6 MGD in 2007. The highest monthly average flow (35.8 MGD) occurred in January 2006 and was more than twice the average dry weather flow. The peak day flow of 74.1 MGD occurred on December 31, 2005 and was almost 4.5 times the dry period average flow. This indicates relatively low I/I as compared to other facilities in Western Oregon."

Section 4 Receiving Water

Page 12, Section 4.2: The following paragraph is added to page 13:

"Outfall 001a is used only during extreme high flows. Per Schedule D, outfall 001a must only be used when the instantaneous flow to the plant exceeds 90 MGD. The treatment plant has not received flows exceeding 90 MGD since December 2005. The daily average and instantaneous treatment plant flows, and the daily average river flows are as follows:

Date	Maximum Instantaneous Plant Flow (MGD)	Daily Average Plant Flow (MGD)	Outfall 001a flow (MGD)	Rogue River Flow (cfs)
12/30/2005	91.9	68.3	~14 MGD	20,800
12/31/2005	93.6	74.1	~15 MGD	15,100

Using the Adams equation (M&E 3rd ed, pg 1224), the dilution at 20 feet downstream from outfall 001 is approximately 16:1 under the 12/31/2005 condition. Outfall 001a is approximately 40 feet downstream of

outfall 001. Using the PLUMES equations for initial mixing (M&E 3rd ed, pg 1228), the dilution from outfall 001a is approximately 36:1. Therefore, the dilution during these high flow scenarios exceeds the dilutions during all low flow scenarios.

For clarification, DEQ has added a condition to the permit restricting the use of outfall 001a to days when the instantaneous flow exceeds 90 mgd."

Page 13, Section 4.2.1: The following sentences are added to the last paragraph on page 13:
"DEQ revised the dilution estimates using CORMIX 7.0GT. All dilution estimates use the treatment plant design average dry weather flow of 20 MGD (31 CFS). The actual dry weather flow is not expected to exceed 20 MGD during the term of the proposed permit."

Page 20, Section 5.3.1.1 Ammonia: The following sentences are added to this section:
"40 CFR Part 122.45(f) Mass limitations, states that all pollutants limited in permits shall have limitations, standards or prohibitions expressed in terms of mass except:
(i) For pH, temperature, radiation, or other pollutants which cannot appropriately be expressed by mass;
(ii) When applicable standards and limitations are expressed in terms of other units of measurement; or
(iii) If in establishing permit limitations on a case-by-case basis under Sec. 125.3, limitations expressed in terms of mass are infeasible because the mass of the pollutant discharged cannot be related to a measure of operation (for example, discharges of TSS from certain mining operations), and permit conditions ensure that dilution will not be used as a substitute for treatment.

The primary purpose for mass limits is to prevent water quality violations from cumulative effects of conservative pollutants. Mass-based limits are particularly important for control of bioaccumulative pollutants. Ammonia, however, is neither a conservative nor a bioaccumulative pollutant since microbes in the receiving stream rapidly oxidize ammonia into nitrate. Therefore, cumulative effects outside of the regulatory mixing zone are not a concern. Also, the Medford RWRF mixing zone does not overlap any other mixing zones. Additionally, effluent limits calculations are based on critical low flow conditions without any allowance for degradation in the mixing zone. Under these conditions, mass-based limits in addition to concentration-based limits are unnecessary for protection on water quality."

Page 20, Section 5.3.1.3 Chlorine: The following sentences are added to this section:
"Similar to ammonia, chlorine is neither a conservative nor a bioaccumulative pollutant since chlorine rapidly reacts with organic matter. Therefore, cumulative effects outside of the regulatory mixing zone are not a concern. Also, the Medford RWRF mixing zone does not overlap any other mixing zones. Additionally, effluent limits calculations are based on critical low flow conditions without any allowance for degradation in the mixing zone. Under these conditions, mass-based limits in addition to concentration-based limits under these conditions are unnecessary for protection on water quality."

Page 23, Section 5.3.2: The first sentence of the sixth paragraph is changed as follows:
"The aquatic toxicity RPA evaluation indicates that there is no reasonable potential for the discharge to cause or contribute to an excursion above the water quality criteria for copper, lead, mercury, silver, zinc, and cyanide at the edge of the defined mixing zone and ZID, and for all other pollutants at the end of pipe."

Page 23, Section 5.3.2: The first sentence of the seventh paragraph is changed as follows:
"The human health RPA evaluation indicates that there is no reasonable potential for the discharge to cause or contribute to an excursion above the water quality criteria for arsenic, nickel and chloroform at

the edge of the defined mixing zone, and for all other pollutants at the end of pipe (see Appendix B3, p. 53)."

Page 24, Section 5.3.2.1. Arsenic: This section is deleted in its entirety because EPA approved the revised human health arsenic criteria of 2.1 µg/L.

Page 27, Section 5.3.2.2. Temperature: The following sentence is added to the first paragraph on this page:
"OAR 340-041-0028(4) states that the temperature criteria is a seven-day-average maximum not to be exceeded. Per DEQ's temperature IMD, these criteria are applied as a rolling seven-day-average."

Page 30, Section 5.4.1 Evaluation of Compliance Options: The following paragraph is added:
"West Yost and Associates, Medford RWRF's engineering consultants, analyzed the potential thermal reductions through in-plant changes. While radiant healing in the process tanks can be significant during the hottest months, during October wastewater is generally cooled as it passes through the treatment plant. Therefore, only projects that remove heated water sources have the potential to reduce temperature during the critical period (October). The most significant in-plant heat source during the critical period is the cooling water from the cogeneration system, which adds about 10.3 million kcals/day to the effluent. Medford RWRF is replacing the cogeneration system with a new system that will include a radiator cooled engine; this project is scheduled to be completed by August 2012. While other sources of heat at the treatment plant are relatively insignificant, DEQ and Medford RWRF will consider other alternatives as they become available. A permit condition in Schedule B requires Medford RWRF to report these activities annually."

Page 32, Section 5.4.3.1. Interim Limits: The second sentence of the second paragraph is changed as follows:
"The Medford RWRF's initial proposed schedule for obtaining thermal credits (June 27, 2011) was based on an initial start up period (2012 – 2014) followed by shading improvements in two-year increments (15%, 20%, 25%, 20%, and 20%) and used critical case calculations provided by DEQ in writing on June 14, 2011."

Page 39, Section 6.2.1.1: The fourth paragraph of this section is revised as follows:
"Requirements for the calculation of mass-based BOD and TSS limits are found in 40 CFR 133.102 and Oregon Administrative Rules Chapter 340 Division 41. While the federal regulations do not require a daily maximum mass-based limits, state regulations may be more restrictive. For existing facilities, OAR 340-041-0061(9) states that:

A) During periods of low stream flows (approximately May 1 through October 31), the monthly average mass load expressed as pounds per day may not exceed the applicable monthly concentration effluent limit times the design average dry weather flow expressed in million gallons per day times 8.34. The weekly average mass load expressed as pounds per day may not exceed the monthly average mass load times 1.5. The daily mass load expressed in pounds per day may not exceed the monthly average mass load times 2.0.

B) During the period of high stream flows (approximately November 1 through April 30), the monthly average mass load expressed as pounds per day may not exceed the monthly concentration effluent limit times the design average wet weather flow expressed in million gallons per day times 8.34. The weekly average mass load expressed as pounds per day may not exceed the monthly average mass load times 1.5. The daily mass load expressed in pounds per day may not exceed the monthly average mass load times 2.0.

C) On any day that the daily flow to a sewage treatment facility exceeds the lesser hydraulic capacity of the secondary treatment portion of the facility or twice the design average dry weather flow, the daily mass load limit does not apply. The permittee must operate the treatment facility at highest and best practicable treatment and control.

The monthly average mass load summer mass limits for CBOD5 and TSS are based on the design average dry weather flow (ADWF) of 20 MGD and the monthly average CBOD5 and TSS concentration limits of 10 mg/L and 10 mg/L, respectively. The winter mass limits for the facility are be based on the AWWF of 25.3 MGD and the monthly average BOD5 or TSS concentration limits of 30 mg/L and 30 mg/L, respectively."

Page 39, Section 6.2.1.1: The calculations section is changed as follows:

"On October 31, 2010, DEQ finalized an Internal Management Directive regarding rounding and significant figures (Sig Fig IMD). Per this IMD, mass limits for BOD and TSS are rounded to 2 significant figures and calculated results where the rounded digit is 5 are rounded up. Therefore, the calculations are as follows:

(1) Summer CBOD5 and TSS

Limit	Calculation	Value (ppd)	Rounded Value (ppd)
Monthly Average	20 MGD x 8.34 #/gal x 10 mg/L	1,668	1,700
Weekly Average	1,700 ppd x 1.5	2,550	2,600
Daily Maximum	1,700 ppd x 2.0	3,400	3,400

(2) Winter BOD5 and TSS

Limit	Calculation	Value (ppd)	Rounded Value (ppd)
Monthly Average	25.3 MGD x 8.34 #/gal x 30 mg/L	6,330	6,300
Weekly Average	6,300 ppd x 1.5	9,450	9,500
Daily Maximum	6,300 ppd x 2.0	12,600	13,000

Page 40, Section 6.2.1.3: The sentence "DMR data for the existing permit cycle was reviewed and effluent data met the permit limit and basin standards. DEQ evaluated pH using a spreadsheet that derives the pH at the mixing zone boundary (see Appendix B4, p. 54)." is changed to:

"Worst case ambient stream flow, pH, temperature and alkalinity were entered into a spreadsheet that derives the pH at the mixing zone boundary (see Appendix B4, p. 54). For the purposes of this evaluation, the maximum and minimum effluent pH was assumed to be 9.0 and 6.0 respectively. The spreadsheet shows that the maximum and minimum instream pH at the edge of the mixing zone would be 8.2 and 6.6, respectively. This is well with the allowed range."

Appendix B4 is replaced with the following:

Calculation of pH of a mixture of two flows.
Based on the procedure in EPA's DESCON program (EPA, 1988. Technical Guidance on Supplementary Stream Design Conditions for Steady State Modeling. USEPA Office of Water, Washington D.C.)

	RPA for pH	
INPUT	Lower pH Criteria	Upper pH Criteria
1. DILUTION FACTOR AT MZ BOUNDARY - (Qe+Qr)/Qe	14	14
2. UPSTREAM/BACKGROUND CHARACTERISTICS		
Temperature (deg C):	16.4	16.4
pH:	7.3	8.1
Alkalinity (mg CaCO3/L):	30.1	30.1
3. EFFLUENT CHARACTERISTICS		
Temperature (deg C):	23.4	23.4
pH:	6.0	9.0
Alkalinity (mg CaCO3/L):	107.0	107.0
4. APPLICABLE PH CRITERIA	6.5	8.5
OUTPUT		
1. IONIZATION CONSTANTS		
Upstream/Background pKa:	6.41	6.41
Effluent pKa:	6.36	6.36
2. IONIZATION FRACTIONS		
Upstream/Background Ionization Fraction:	0.89	0.98
Effluent Ionization Fraction:	0.30	1.00
3. TOTAL INORGANIC CARBON		
Upstream/Background Total Inorganic Carbon (mg CaCO3/L):	33.97	30.71
Effluent Total Inorganic Carbon (mg CaCO3/L):	351.89	107.24
4. CONDITIONS AT MIXING ZONE BOUNDARY		
Temperature (deg C):	16.90	16.90
Alkalinity (mg CaCO3/L):	35.59	35.59
Total Inorganic Carbon (mg CaCO3/L):	56.68	36.18
pKa:	6.40	6.40
pH at Mixing Zone Boundary:	**6.6**	**8.2**
Is there Reasonable Potential?	**No**	**No**