MWMC Eugene-Springfield WPCF Facility Plan – Water Quality Regulatory Update

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Executive Summary

This memorandum focuses on a review of current and potential water quality issues associated with the Eugene-Springfield Water Pollution Control Facility (E-S WPCF) and assesses how those issues may impact future National Pollutant Discharge Elimination System (NPDES) permits, treatment technologies, source control programs and reuse opportunities through the study period of 2025. A number of the water quality issues examined may present challenges for the E-S WPCF in the future.

Water quality issues can be divided into two categories: pollutant issues, and regulatory issues. Both have the potential to impact the selection of near-term and long-term treatment solutions for the E-S WPCF. In particular, the issues were examined for their potential to impact wastewater treatment technology and operations, future NPDES permit changes, the source control program, and also whether there were opportunities for reuse.

The following water quality issues were evaluated:

Pollutant Issues

- Carbonaceous biochemical oxygen demand (CBOD) and total suspended solids (TSS) Mass Limitations
- 85% Removal
- Ammonia
- Phosphorus
- Dissolved Oxygen
- Bacteria
- Turbidity
- Total Dissolved Solids
- Temperature

Regulatory Issues

- Biocriteria
- Blending
- Sanitary sewer overflow/capacity management, operation, and maintenance (SSO/CMOM)
- Emerging Issues
- Critical Conditions/Allowable Dilution Ratios
- Willamette River 7Q10 (lowest 7-day average flow based on 10-year return interval)

- Toxicity
- Metals
- Mercury
- Arsenic
- Cyanide
- Dioxins and Furans
- Volatile Organic Compounds
- Mixing Zone
- Design Flows

Ammonia, mercury, and temperature are the pollutants that have the most potential to impact recommended treatment technologies and the NPDES permit. Recently, Oregon adopted new water quality standards for temperature, while the future regulatory scenario for ammonia and mercury remains somewhat uncertain.

Ammonia: The Oregon water quality criteria for ammonia is currently under review and may be revised in the near future. If the revisions proceed as anticipated, the reasonable potential analysis performed for the recent permit renewal would need to be recalculated, and it is likely there would be no finding of a reasonable potential to cause an exceedance of the new water quality criteria. A permit modification could potentially be requested at that time to eliminate the ammonia effluent limitations.

Mercury: A total maximum daily load (TMDL) for mercury is currently being developed for the Willamette River. The requirements resulting from the TMDL are uncertain at this time. Two potential options are a waste load allocation for the facility, or a requirement for the facility to develop and implement a mercury reduction plan.

Temperature: In early March 2004 the U.S. Environmental Protection Agency (EPA) approved Oregon's new water quality standards for temperature. The Oregon Department of Environmental Quality (DEQ) is developing a temperature TMDL for the Willamette based on the new Oregon standard. The details of the TMDL are still to be worked out, but will probably result in a revised thermal load limitation for the facility.

The regulatory issues with the most potential to impact the facilities are the developing regulations for SSOs and CMOM requirements, as well as the issue of the legality of blending.

- **SSO/CMOM:** A significant change in SSO requirements would override the Oregon regulations, and would be a driver for future wet weather improvements
- **Blending:** Blending, or split flow, refers to the practice of diverting flow around a treatment component (usually secondary treatment) during high flows. The E-S WPCF was designed to operate using blending when flow exceeds the secondary treatment system capacity. This practice is not acknowledged in the NPDES permit and is currently under review by EPA. It was also the subject of a 2003 lawsuit against the EPA *(Pennsylvania Municipal Authorities Association v. Whitman).* In late 2003, EPA issued for public comment a proposed blending policy which, if promulgated, would clarify that blending is a legal practice, subject to some "principles" outlined in the proposal. The

proposal focused on the practice of routing high flows around secondary treatment units, and left unanswered the question of routing flows around primary clarification units. The proposal also required that re-routed flows be blended together before discharge. As a result of the EPA proposal, the lawsuit mentioned above was dismissed; however, the future of the blending proposal is somewhat uncertain, particularly as a result of changes in the Assistant Administrator for Water position at EPA. For the purposes of this review, it is assumed that blending will continue to be allowed. If in the future the practice of blending is determined to be illegal, this will have a significant impact on the wet weather capacity of the E-S WPCF, and additional capacity improvements will be required.

Introduction

The Eugene-Springfield Water Pollution Control Facility (E-S WPCF) currently meets all discharge requirements identified in their National Pollutant Discharge Elimination System (NPDES) permit, which was renewed in May 2002 and expires in December 2006. The Metropolitan Wastewater Management Commission (MWMC) is currently evaluating the facility's short- and long-term needs in order to continue to consistently meet the requirements of their NPDES permit. Projected growth in the area resulting in increased flow and loads or changed influent quality, as well as changing regulations, will impact both the near-term and long-term treatment solutions recommended for the E-S WPCF.

The impact of increased growth on the flow and loads to the E-S WPCF was discussed in a separate technical memorandum prepared by CH2M HILL on April 12, 2004, and issued to MWMC. Future flows and loads, based on projected Eugene-Springfield populations, were developed through 2025.

The purpose of this memorandum is to review current and potential future water quality issues associated with the E-S WPCF, and how these issues would impact the selection of both near-term and long-term solutions for the E-S WPCF.

Existing Water Quality Regulations

The Oregon Department of Environmental Quality (DEQ) issued a renewed NPDES permit for the E-S WPCF in May 2002. The previous NPDES permit expired in 1997, and the current NPDES permit (No. 102486) expires December 31, 2006.

The discharge limitations and requirements for the WPCF's current NPDES permit are summarized in Table 1. These discharge limitations and requirements are defined for three categories of wastewater sources:

1. Treated effluent: outfall 001 (diffuser) and outfall 001A (bank outfall)
2. Reclaimed water: outfall 101 (Level II) and outfall 102 (Level III)
3. Emergency sanitary sewer overflows (SSOs): outfalls 002 to 014

TABLE 1
Existing NPDES Discharge Requirements and Limitations for the Eugene-Springfield WPCF
MWMC Facility Plan, Eugene-Springfield

(1) Treated Effluent Outfall 001 and 001A (No discharge from Outfall 001A from May 22 through October 31 unless approved by the Oregon Department of Environmental Quality)

May 1 – October 31:

Parameter	Average Effluent Concentrations Monthly	Weekly	Monthly[1] Average (lb/day)	Weekly[1] Average (lb/day)	Daily[1] Maximum (lbs)
$CBOD_5$	10 mg/L	15 mg/L	4100	6100	8200
TSS	10 mg/L	15 mg/L	4100	6100	8200

November 1 – April 30:

Parameter	Average Effluent Concentrations Monthly	Weekly	Monthly[1] Average (lb/day)	Weekly[1] Average (lb/day)	Daily[1] Maximum (lbs)
$CBOD_5$	25 mg/L	40 mg/L	16000	24000	32000
TSS	30 mg/L	45 mg/L	19000	28000	38000

Year Round:

Parameter	Limitations
E. coli Bacteria	Shall not exceed 126 organisms per 100 ml monthly geometric mean. No single sample shall exceed 406 organisms per 100 ml.
pH	Shall be within the range of 6.0 - 9.0
$CBOD_5$ and TSS Removal Efficiency	Shall not be less than 85% monthly average for $CBOD_5$ and 85% monthly for TSS.
Total Residual Chlorine	Shall not exceed a monthly average concentration of 0.05 mg/L or a daily average concentration of 0.12 mg/L
Excess Thermal Loading: May 1 – Oct 31 (Summer)	Shall not exceed a weekly average of 3.1 billion BTUs per day
Ammonia: May 1 – Oct 31 (Summer) *(Not specified in permit, but should be expressed as Ammonia – N)*	Shall not exceed 22 mg/L daily Maximum and 12 mg/L monthly average.

The permit also defines the mixing zone as follows:

The allowable mixing zone is that portion of the Willamette River from 20 feet upstream of the diffuser to 200 feet downstream of the diffuser. In addition, the zone of immediate dilution (ZID) shall include that portion of the Willamette River within 50 feet downstream of the diffuser.

TABLE 1
Existing NPDES Discharge Requirements and Limitations for the Eugene-Springfield WPCF
MWMC Facility Plan, Eugene-Springfield

The permit also contains the following language regarding effluent limitations:

This permit contains either technology or water quality based effluent limits for those parameters discharged by the permittee that the Department has determined require effluent limitations to comply with the water quality standards found in OAR 340-41-445 outside the above mixing zones. The limits were established on the basis of the information provided by the permittee and following the Department's rules, including OAR 340-41-026. Other parameters also were identified in the permittee's application for which the Department did not establish effluent limitations. The Department has determined that those parameters do not present a reasonable potential to violate applicable water quality standards. The permittee is required to notify the Department if changes occur in its processes or influent stream which could significantly change the effluent stream for any of those parameters.

(2) Reclaimed wastewater outfall 101 and 102

No discharge to state waters is permitted. All reclaimed water reuse shall prevent:

a. Prolonged ponding of treated reclaimed water on the ground surface
b. Surface runoff or subsurface drainage through drainage tile
c. The creation of odors, fly and mosquito breeding, or other nuisance conditions
d. The overloading of land with nutrients, organics, or other pollutant parameters
e. Impairment of existing or reasonably probable beneficial uses of groundwater

Outfall 101:

Prior to reuse of the reclaimed water, it shall receive at least Level II treatment as defined in OAR 340-55 to: Reduce Total Coliform to 240 organisms per 100 ml in two consecutive samples, and a 7-day median of 23 organisms per 100 ml.

Outfall 102:

Prior to reuse of the reclaimed water, it shall receive at least Level III treatment as defined in OAR 340-55 to: Reduce Total Coliform to 7-day median of 2.2 organisms per 100 ml and maximum of 23 organisms per 100 ml.

Irrigation shall conform to the irrigation management plan approved by the Department in accordance with OAR 340-55 for agricultural, commercial, or industrial use.

(3) Emergency Overflow Outfalls 002 through 014

(1) No wastes shall be discharged from these outfalls and no activities shall be conducted which violate water quality standards as adopted in OAR 340-41-0445, unless the cause of the discharge is due to storm events as allowed under OAR 340-41-120 (13) or (14) as follows:

(2) Raw sewage discharges are prohibited to waters of the state from November 1 through May 21, except during a storm event greater than the one-in-five-year, 24-hour duration storm, and from May 22 through October 31, except during a storm event greater than the one-in-ten-year, 24-hour duration storm.

If an overflow occurs between May 22 and June 1, and if the permittee demonstrates to the Department's satisfaction that no increase in risk to beneficial uses occurred because of the overflow, no violation shall be triggered if the storm associated with the overflow was greater than the one-in-five-year, 24-hour duration storm.

[1] Average dry weather design flow to the facility equals 49 mgd. Summer mass load limits based on average dry weather design flow to the facility. Winter mass load limits based on average wet weather design flow to the facility equaling 75 mgd. The daily mass load limit is suspended on any day in which the flow to the treatment facility exceeds 98 mgd (twice the design average dry weather flow).

The treated effluent discharge has mass load and concentration limitations for carbonaceous 5-day biochemical oxygen demand ($CBOD_{5)}$ and total suspended solids (TSS) established for the dry season (May 1 – October 31) and the wet season (November 1 – April 30). These current mass load limitations are the same as for the previous NPDES permit, and these are based on the standards for the Willamette Basin. The permit requires 85 percent removal of BOD_5 and TSS, and the permit also allows for the daily mass load limitations to be suspended on any day that the influent flow exceeds 98 mgd (or twice the design average dry weather flow).

The permit does not address effluent blending or selective treatment operation methods that are used by the E-S WPCF when plant flows exceed the maximum day hydraulic capacity. Under these conditions a portion of the primary effluent flow is directed to the chlorine contact basins to mix with secondary effluent for disinfection.

Treated effluent also includes limitations for ammonia, bacteria (*E. coli*), pH, total residual chlorine, and excess thermal loading (during May 1 – Oct. 31). The ammonia and excess thermal load limitations are new to this permit.

The untreated emergency SSOs have specific limits on the seasonal timing and storm event conditions that create circumstances such that these discharges are unavoidable and allowable under state law, OAR 340-41-120 (13) or (14).

The third category of discharge that is addressed in the NPDES permit is reclaimed wastewater. MWMC is constructing a reclaimed water pipeline from the E-S WPCF to the Biosolids Management Facility (BMF) to provide water to the planned poplar plantation and the BMF's belt filter presses. No reuse is permitted without meeting specific permit conditions and providing a specific plan for its use. The permit specifies that prior to any use of reclaimed water it must receive at least Level II or Level III treatment as defined in OAR 340-55, and must meet specific bacteria limitations.

Discussion of Potential Future Water Quality Regulations

A detailed review and evaluation of current and potential future water quality regulations and potential treatment, discharge, and permit impacts that could result from changing regulations and changing effluent discharge flows and concentrations are presented in Table 2. Table 2 includes alternative disposal and source control suggestions that may help alleviate or mitigate potential treatment, discharge, and permit impacts.

The Willamette River in the vicinity of the WPCF's discharge has been listed as water quality impaired for temperature and mercury in fish tissue, and total maximum daily loads (TMDLs) for these parameters are currently being developed by Oregon DEQ. The 2002 List of Impaired Waters in Oregon (303(d) list) added arsenic, and a future TMDL may be developed for arsenic as a result of this listing.

TABLE 2
Potential Future Water Quality Regulations and Impacts
MWMC Facility Plan, Eugene-Springfield

Issue	Treatment Impact	Permit Impact	Source Control	Alternative Disposal/Reuse
CBOD and TSS Mass Limitations				
Mass limitations in current permit are based on average dry weather design flow (49 mgd) and average wet weather design flow (75 mgd). Daily mass limitation is waived when daily flow exceeds twice average dry weather design flow (98 mgd).	Any increases in plant flows above the design flows would result in the need to discharge CBOD and TSS at concentrations below the concentrations listed in the permit.	Potential for change in permit effluent limitation. If plant improvements result in an increase in the design average dry or wet weather flows, this would provide justification for requesting an increase in permitted mass limitations of CBOD and TSS. Any such request for an increase in mass limitations would require Environmental Quality Commission (EQC) approval according to OAR 340-41-0120. EQC approval of a mass load increase may not be granted – it is EQC's policy to not allow increases in mass loads except under specific circumstances. An increase in the average dry weather design flow would increase the flow threshold at which the daily mass limitations are waived.	Not a source control issue.	Any reuse or alternative disposal of treated wastewater will reduce the mass load discharges to the Willamette River.
85% Removal				
The current permit contains language in Schedule D which indicates that a lower percentage removal requirement may be available "provided the permittee can adequately demonstrate that the conditions for a lesser percentage removal exist or will exist in the design life of the treatment facility." Wet Weather Flow Management Plan (WWFMP) has been developed.	N/A	Potential for change in permit effluent limitation. Current permit outlines process for seeking reduction in removal efficiency requirements. Requires: • The entire system must be flow mapped, by subbasin, and all sewer system overflow points identified • Unless otherwise approved in writing by the Department, all inflow sources must be identified • The treatment facility shall be evaluated to determine the maxi-	Source control here is infiltration and inflow (I/I) removal – WWFMP implementation.	No opportunity for alternative disposal or reuse.

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		mum monthly flow at which 85% removal of BOD and TSS can be achieved. In addition, the permittee shall evaluate what percentage reduction of BOD and TSS is achievable at peak design monthly flows consistent with a 2-year high month precipitation event.		
Ammonia				
Two potential scenarios: 1. Assume current Oregon water quality criteria for ammonia continues to be basis for effluent ammonia limitation. 2. Assume Oregon adopts EPA's 1999 update of water quality criteria, as recommended by Triennial Review Policy Advisory Committee. EQC action is expected in April 2004. This would result in a relaxation of the acute and chronic criteria. Based on data used for the 2002 permit, (and presumably current data) reasonable potential for exceedances of acute and chronic criteria would not exist, removing justification for ammonia effluent limitation. Current chronic criterion drove previous reasonable potential finding. Note that Idaho has adopted 1999 EPA criteria; Washington is currently reviewing its standards, and is recommending adopting 1999 acute criteria, but not the chronic criteria.	1. Ammonia reduction treatment technologies required. 2. If new criteria based on EPA's 1999 update are adopted in Oregon, requirement for ammonia removal would not exist. Preliminary calculations of effluent limitations would be on the order of 80 mg/L daily average, and 40 mg/L monthly average.	1. No impact to permit. 2. Potential for change in permit effluent limitation. If new criteria based on EPA's 1999 update are adopted in Oregon, MWMC could request re-opening the permit and removal of the ammonia effluent limitation. It would appear that this would not contradict the anti-backsliding requirements of the Clean Water Act (CWA) (the language in section 303(d)(4)(B) would appear to allow the relaxation), but legal advice may be necessary. The current permit also contains the following language, which indicates that permit limitation changes are permissible: *The permit limitations for ammonia are based upon the current Oregon Water Quality Standards, OAR 340-041 Table 20. This permit may be re-opened and the limits modified upon adoption of a new Oregon standard for ammonia.*	Pretreatment program staff have evaluated whether a local limit for ammonia would be beneficial, and have concluded that the industrial/commercial loading of ammonia is too small to justify a local limit.	Use of the poplar farm or other sites to dispose of ammonia (facultative lagoon decant) will reduce the ammonia load to the treatment plant.

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Phosphorus				
The data set used for the 2002 303(d) list determination indicates 0% of samples in the Willamette River in the Eugene-Springfield area exceed the chlorophyll a criterion. Total phosphorus in the river occasionally exceeds the "guidance" value, usually associated with high river flow and high turbidity events, and is not related to treatment plant effluent.	N/A	No impact to permit.	Not a source control issue.	No opportunity for alternative disposal or reuse.
Dissolved Oxygen				
The Willamette River in the Eugene area is not included in the 303(d) list for dissolved oxygen (DO). The DO model of the river developed for the Willamette River Study (or another model) could be run to investigate whether DO might be a future problem.	Could be a treatment issue if future DO criteria exceedances occur in river.	Potential future permit issue if DO criteria exceedances occur in river.	Not a source control issue.	No opportunity for alternative disposal or reuse.
Bacteria				
Indicator organism was changed in last permit renewal to *E. coli*. Plant has been in compliance with new limitation, but has experienced a higher than expected frequency of resample incidents.	Alternative disinfection will be investigated as part of the treatment plant improvements.	No impact to permit.	Not a source control issue.	No opportunity for alternative disposal or reuse.
Turbidity				
Oregon's water quality standard for turbidity is currently being reviewed. A July 2003 draft of a revised standard would restrict turbidity increases at the edge of the mixing zone to 3 nephelometric turbidity units (NTUs) as monthly average, or 5 NTU averaged over one hour.	If turbidity standard becomes more restrictive, potential future treatment issue. July 2003 draft of new turbidity standard should not result in any new treatment requirements.	If turbidity standard becomes more restrictive, potential future permit issue. If July 2003 draft of new turbidity standard is approved, new turbidity effluent limitation and monitoring requirement would be added to permit, probably at next renewal.	Not a source control issue.	No opportunity for alternative disposal or reuse.

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Facility complies with current standard, which is based on an allowable percentage increase (10%) in turbidity from an activity.				
Total Dissolved Solids				
The TDS standard in the Willamette River is 100 mg/L. No current compliance issues.	N/A	No impact to permit.	TDS can be an issue in discharge permit development for high-flow, high-tech industries.	No opportunity for alternative disposal or reuse.
Temperature				
After a period of uncertainty, the regulatory environment for temperature discharges has become clearer. In March 2004 EPA approved Oregon's new temperature standards.. A temperature total maximum daily load (TMDL) for the Willamette River system is being developed by Oregon DEQ, based on the new standards. The current NPDES permit was issued with a thermal load limitation that was based on the dry weather design average flow. In June 2003 DEQ published guidance that specifies that the maximum weekly design flow should be used in this calculation.. A Temperature Management Plan for the facility was developed and approved by Oregon DEQ prior to permit renewal. The new Oregon standards contain an increased human use allowance (0.3 degrees C), together with a restriction on the amount of 7Q10 flow that can be allowed for dilution (25%). The new Oregon standards reference maps showing salmonid rearing, migration, and spawning areas. The	Temperature impacts should be considered in any treatment plant re-design alternatives analysis. The Temperature Management Plan for the facility includes the following short-term activities: *Treatment process management procedures will be assessed to identify options for reducing thermal loads to the waste stream; and Capital Improvement Projects planned for the E-S WPCF under the current five-year Capital Improvement Plan will be evaluated during design for feasibility of implementing thermal load reduction technologies.*	Potential for change in permit effluent limitation. The June 2003 DEQ guidance on calculation of publicly owned treatment works (POTW) thermal load limitations, the guidance should be evaluated and, if appropriate, a permit modification should be requested. Regarding post-TMDL POTW thermal load limitations, Oregon DEQ has indicated that if the TMDL results in a thermal load allocation to a POTW larger than the pre-TMDL limitation, a more restrictive pre-TMDL limitation would be carried forward into subsequent permits, because of anti-backsliding requirements. This is still under review at Oregon DEQ. If necessary, this should be reviewed by legal counsel, and may result in permit negotiation.	Current sewer system regulations contain restrictions on temperature for industrial and commercial dischargers based on their potential to impact treatment efficiency. The Temperature Management Plan for the facility includes the following short-term activity: *A review of the temperature characteristics of major dischargers, such as permitted industrial dischargers, will be conducted to identify options for reducing thermal loads to the E-S WPCF* (Report due 12/31/2003).	Any reuse or alternative disposal of treated wastewater will reduce the thermal load discharges to the Willamette River.

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Issue	Treatment Impact	Permit Impact	Source Control	Alternative Disposal/Reuse
maps indicate that the Willamette River in the area of the WPCF is listed as a rearing and migration area, but also as a spawning area from Oct 15 through June 15. This designation as a spawning area could cause problems, particularly during a warm, dry October.				
Toxicity				
No current problems complying with toxicity requirements in the permit.	N/A	See Mixing Zone. Any future reductions in approved mixing zone dilution ratios could affect toxicity compliance.	Could be source control issue if a future effluent toxicity situation requires identification and removal of a toxicity source.	No opportunity for alternative disposal or reuse.
Metals				
Current effluent and biosolids metals concentrations are well below any regulatory thresholds. Some changes to the Oregon criteria for metals are expected as a result of triennial review. New criteria are expected to be adopted by the EQC in April 2004, including metals criteria expressed as dissolved. This will reduce the likelihood of water quality-based effluent limitations for metals becoming a permit issue..	N/A	If effluent metals become an issue in the future, site-specific criteria could be proposed for approval by Oregon DEQ, based on water effect ratio or other mechanisms. If desired, data could be collected to establish a value for the "translator" to convert dissolved criteria to total recoverable permit limitations, in anticipation of the next permit renewal cycle.	Metals are regulated in industrial discharges through local limits and categorical industrial limits. Most metals local limits are driven by the biosolids quality goal adopted by MWMC.	No opportunity for alternative disposal or reuse.
Mercury				
Future regulatory requirements for mercury are uncertain at this time. A TMDL for mercury in the Willamette River is being developed by Oregon DEQ, although the final format of the TMDL, and how it might impact POTWs, is not clear. It is expected that the TMDL will result in a requirement for imposition of best management practices (BMPs) to reduce mercury discharges to the collection system.	N/A	Potential for new permit effluent limitation. Will be permit negotiation issue if TMDL results in a waste load allocation proposal for next permit renewal.	Source Control staff have sampled significant industrial users for mercury, and have requested voluntary reductions when mercury was found. All discharges were below current local limits. TMDL may result in a new local limit being developed. BMPs for dental offices are under development.	No opportunity for alternative disposal or reuse.

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Mercury effluent data for several years were obtained using clean sampling techniques and EPA Method 1631.			Reduction of influent mercury loading is currently an Environmental Management System (EMS) target.	
Arsenic				
Willamette River was listed in the 2002 303(d) list for exceedances of the arsenic human health criterion for "water and fish ingestion." This listing could eventually lead to development of a TMDL for arsenic. This situation is somewhat analogous to that of mercury, in that the arsenic pollution is naturally occurring and presumably not related to identifiable point or non-point sources.	N/A	Potential for new permit effluent limitation. Could be future effluent limitation for arsenic based on TMDL.	Could be future source control issue.	No opportunity for alternative disposal or reuse.
Cyanide				
Cyanide discharges into the treatment facility are currently below the calculated maximum headworks loading. Analytical laboratory results for final effluent indicate detectable levels of total cyanide, while analysis of secondary effluent before chlorination has consistently been non-detectable. These analytical results for total cyanide concentrations are not high enough to cause an exceedance of a water quality standard in the Willamette River. The causes of detectable cyanide in chlorinated effluents are the subject of current research.	N/A	Current concentrations of materials analyzed as total cyanide are not a permit issue.	Cyanide is regulated in industrial discharges through local limits and categorical industrial limits.	No opportunity for alternative disposal or reuse.
Dioxins and Furans				
A toxic equivalency factor approach for the human health criteria for dioxins and furans will be included in the proposed changes for Oregon standards. This approach may result in more criteria	N/A	Potential future permit issue. (May be monitoring requirement in future).	Could be future source control issue.	No opportunity for alternative disposal or reuse.

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exceedances.				
Volatile Organic Compounds				
Treatment facility influent is monitored for volatile organic compounds (VOCs). Treatment plant emissions based on these concentrations would be a "worst case" for VOC emissions, and these are currently below any regulatory threshold. Reduction of air pollution from the treatment facilities, including VOCs, is currently an EMS Objective.	N/A	Not anticipated to be a permit issue.	VOCs are currently regulated through the explosivity or sewer system fume toxicity requirements. If necessary, discharge limitations for VOCs could be developed.	No opportunity for alternative disposal or reuse.
Biocriteria				
Oregon DEQ is in the process of developing biocriteria. When completed, it is anticipated that these criteria will include criteria for large rivers such as the Willamette. These biocriteria may contain indices for aquatic organisms, such as macroinvertebrate diversity and abundance.	N/A	When developed, biocriteria requirements will likely be included in future permits.	Could potentially be a source control issue if future biocriteria requirements are not met.	No opportunity for alternative disposal or reuse.
Blending				
Also known as "split flow" "select treatment" etc., this refers to the practice of diverting flow around a treatment component (usually secondary treatment) during high flows. The E-S WPCF was designed to operate using blending when flow exceeds the secondary system capacity. The practice is not acknowledged in the NPDES permit. In late 2001, EPA issued draft guidance on wet weather permitting issues, including blending. In 2002, two regional POTW groups and one city challenged in court EPA Headquarters' and Regions 3, 4, and 6's inconsistent positions on	The future legality of blending remains uncertain. However, alternatives considered for improvements to the treatment facility should include opportunities for blending.	Potential for change in permit language. If the legality of blending is clearly established, corresponding language should be included in the NPDES permit, either at the next scheduled renewal, or if the permit is re-opened for another reason. The recently issued Clean Water Services permit contains authorization for blending (routing of flows around secondary treatment units).	Not a source control issue.	No opportunity for alternative disposal or reuse.

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blending. Following issuance of a proposed policy on blending in late 2003 from EPA, this case was dismissed. The future of the policy is uncertain at this time.				
SSO/CMOM				
This is another area with some regulatory uncertainty. EPA's proposed Sanitary Sewer Overflow (SSO) rule was withdrawn from the *Federal Register* in January 2001 for further review. The SSO proposal has remained on hold ever since. EPA has committed to substantial revisions within the rule preamble that will include alternative regulatory options. Among the alternatives being considered is using implementation of the capacity management, operation, and maintenance (CMOM) plans as the standard for SSO control, instead of the current zero overflow standard in the proposed rule. Oregon's current SSO rules are embedded in the bacteria water quality standard, which prohibits overflows from less than a 5-year 24-hour winter storm, and from a less than 10-year 24-hour summer storm.	Fundamental driver for wet weather improvements. Collection system and treatment facility capacity improvements to reduce or eliminate the potential for SSOs. Difference between proposed federal standard of zero overflows versus Oregon's approach.	Potential for change in permit language. Any changes to federal regulations for SSOs or CMOM requirements will be permit issues.	Not a source control issue.	No opportunity for alternative disposal or reuse.
Emerging Issues				
Increasing attention is being paid to the presence of pharmaceuticals, hormones, and other organic contaminants such as caffeine, insect repellant, and fire retardant in treated wastewater discharges. The effects of these compounds in receiving waters is currently not known.	No treatment impact in near future. If environmental effects of these trace organic contaminants in treated wastewater effluents are confirmed in the future, then treatment technologies will be researched and developed, and may eventually be required.	No impact to permit in near future. If this issue continues to evolve, likely first permit impact would be a monitoring requirement.	Not currently a source control issue.	No opportunity for alternative disposal or reuse.

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Another emerging issue is the increasing resistance of pathogens to antibiotics. A corresponding resistance of water-borne pathogens to chlorine, perhaps as a result of over-usage of chlorine disinfectants in our society, has not been investigated. Increased future downstream beneficial uses may result in more attention to these issues.	This issue may become another driver to consider alternate disinfection technology in the future.	Possibly a future impact on the permit if alternative disinfection becomes a requirement	Not a source control issue	Could become an issue for reuse if alternative disinfection becomes a requirement
Critical Conditions/Allowable Dilution Ratios Three factors contribute to calculation of the treatment facility's allowable dilution ratios: the Willamette River 7Q10 , the analysis of the mixing zone, and the treatment facility's design flows. A change to any of these factors will result in a change to the allowable dilution ratios, with corresponding changes to future water quality-based effluent limitations.				
Willamette River 7Q10				
Recent years having less than normal precipitation may result in a change to the river's 7Q10 (lowest 7-day average flow based on 10-year return interval). The 7Q10 is also dependent on U.S. Army Corps of Engineers operations. This flow is one of the factors that determines the allowable dilution ratios at the edge of the mixing zones.	N/A	Potential for change in permit effluent limitation. Any changes to the Willamette River 7Q10 will result in changes to the calculated allowable dilutions at the mixing zone, and therefore changes to water quality-based effluent limitations.	Not a source control issue.	No opportunity for alternative disposal or reuse.
Mixing Zone				
The last mixing zone study was performed in 1993, and approved by Oregon DEQ in 1995. Since then, the river morphology has been altered, particularly as a result of several high flow years. It appears the mixing ratios are less now than in 1993. Endangered Species Act (ESA) issues will need to be considered in any new mixing zone study (salmon passage, etc.) DEQ's June 2003 draft revisions to the	A new mixing zone study may result in the need to evaluate modifications to the diffuser.	Potential for change in permit effluent limitation. Any changes resulting from a new mixing zone study will need approval from Oregon DEQ. A new mixing zone study would result in a new calibrated dilution model. Running the model for critical conditions will produce the allowable dilutions for the edge of the mixing zone and the zone of immediate dilution (ZID). These dilutions are then used to calculate water quality-based	Not a source control issue.	No opportunity for alternative disposal or reuse.

TABLE 2
Potential Future Water Quality Regulations and Impacts
MWMC Facility Plan, Eugene-Springfield

Issue	Treatment Impact	Permit Impact	Source Control	Alternative Disposal/Reuse
mixing zone rules contains language on salmonid migration blockage that would restrict diffuser width to 25% of river width. The existing diffuser has been approved, and the current mixing zone defined in the permit. However, this should be carefully reviewed and, if necessary, comments prepared for the public comment period.		effluent limitations.		
Design Flows				
Any treatment plant improvements resulting in a change to the facility's design flows may result in a change to limitations and dilution ratios and potentially provide justification for a change in CBOD and TSS mass limitations. An increase in the average dry weather design flow would result in an increase in the annual compliance determination permit fee (higher fee classification begins at 50 mgd).	N/A	Potential for change in permit effluent limitations. Changes to the design flows will need to be approved by Oregon DEQ. A change to the average dry weather design flow will result in changes to the allowable dilution ratios for the mixing zone, which are based in part on the design flow. Changes to these dilution ratios could result in changes to water quality-based effluent limitations, probably at next permit renewal. CBOD and TSS mass limitations are based on average dry weather and average wet weather design flows. Increases to these permitted mass limitations requires EQC approval. It is EQC's policy to not allow mass load increases, except under specific circumstances.	Change in allowable mixing zone dilution ratios may result in local limit revisions for pollutants with water quality-based local limits.	No opportunity for alternative disposal or reuse.

Conclusions and Recommendations

Ammonia, mercury, and temperature are the pollutants that have the most potential to impact future recommended treatment technologies and the NPDES permit. The future regulations for ammonia and mercury remain uncertain. The recent (March 2004) approval by EPA of Oregon's new temperature standard has clarified that situation somewhat, although some implementation issues remain uncertain.

The Oregon water quality criteria for ammonia are currently under review, and may be revised in the near future. If the revisions proceed as anticipated, the reasonable potential analysis performed for the recent permit renewal would need to be recalculated, and it is likely that there would be no finding of a reasonable potential to cause an exceedance of the new water quality criteria. If there is no finding of a reasonable potential using the new criteria, then a permit modification could potentially be requested to eliminate the ammonia effluent limitations. However, because the current NPDES permit contains a summertime ammonia limitation and it is not assured that the future ammonia limitation will be removed, any recommended treatment technology to meet future E-S WPCF needs should be flexible enough to meet the more stringent summertime ammonia limitations outlined in the current NPDES permit.

A TMDL for mercury is currently being developed for the Willamette River. The requirements resulting from the TMDL are uncertain at this time. Two potential options are a waste load allocation for the facility, or a requirement for the facility to develop and implement a mercury reduction plan. Any mercury reduction plans are unlikely to affect future recommended treatment technologies at the E-S WPCF and will likely be implemented as source control reductions.

In March 2004 the EPA approved Oregon's new water quality standards for temperature. A TMDL for temperature based on the new Oregon standard is being developed by Oregon DEQ. This TMDL will probably result in a revised thermal load limitation for the facility.

The current NPDES permit limits the weekly excess thermal load to the Willamette River to 3.1 million BTUs. The allowable excess thermal load limitation was based on the average dry weather flow and the 7-day moving average maximum effluent temperature. The weekly average excess thermal load is to be calculated using the average weekly flow and the weekly average of the daily maximum effluent temperatures. This implies an excess thermal load limitation based on an average dry weather season flow with compliance based on the dry weather peak week flow. Historical dry weather peak week flow factors obtained from the past 12 years average 1.7 and saw a maximum of 2.8. Thus, the calculation to determine thermal load compliance is immediately at the disadvantage of the dry weather peak week factor for compliance. In June 2003 DEQ published new guidance for calculation of excess thermal load limitations, and recommended using the maximum weekly average flow for the calculation. Modification of the thermal load limitation using the new guidance is recommended.

The regulatory issues with the most potential to impact the facilities are the developing regulations for SSOs and CMOM, and the issue of the legality of blending.

Perhaps the most significant impact to potential future treatment technologies lies in the changing regulations for SSO requirements. A change in SSO requirements that would

override the Oregon regulations and eliminate overflows would in itself be a driver for significant future wet weather improvements. This impact, combined with the potential elimination of the practice of conventional primary effluent blending with secondary effluent, would have the largest impact to the facility and potential treatment technologies must accommodate this possibility. Recommended future treatment technologies should include alternatives for various combinations of SSO possibilities and blending techniques.

Blending or split flow refers to the practice of diverting flow around a treatment component (usually secondary treatment) during high flows. The E-S WPCF was designed to operate using blending when flow exceeds the secondary system capacity. The practice is not acknowledged in the NPDES permit and is currently under review by EPA. In late 2003 EPA issued for public comment a proposed policy on blending that if adopted would clarify that blending is a legal practice, subject to six principles outlined in the proposal. The proposal does not include routing of flows around primary clarification units in the definition of blending, and also would require that all re-routed flows be combined before discharge. For the purposes of evaluating future treatment technologies it is recommended that the E-S WPCF look at solutions that are flexible enough to implement either conventional primary effluent blending or equivalent secondary effluent blending. If the practice of blending becomes illegal in the future, this will have a significant impact on the wet weather capacity of the E-S WPCF, and additional capacity improvements will be required. Note that the recently issued Clean Water Services, Oregon permit includes authorization for blending during high flows, restricted to routing of flows around secondary treatment units.