Hollingsworth & Vose Response to Comments on Draft National Pollutant Discharge Elimination System (NPDES) Permit No. MA0004561

Introduction

In accordance with the provisions of 40 C.F.R. §124.17, this document presents EPA's responses to comments (RTC) received on the Draft NPDES Permit (MA0004561). The RTC explains and supports EPA's determinations that form the basis of the final permit. The Hollingsworth & Vose draft permit public comment period began October 16, 2009 and ended on November 14, 2009. The permittee commented on the draft permit as specified below. Since the fact sheet is a final document, no changes were made. Instead, the fact sheet comments were noted and a response to them is included in this document.

The final permit has changed from the draft permit based on comments received as well as clarifications based on intra-agency review within EPA and inter-agency review with the Massachusetts Department of Environmental Protection (MassDEP). EPA's decision-making process has benefitted from the various comments and the additional information submitted. The information and arguments did not result in any substantial new changes to the permit. However, a few improvements and changes are detailed in this document and reflected in the final permit. A summary of the changes made in the final permit is listed below. The analyses underlying these changes are explained in the responses to individual comments. Each change is followed by a number that correlates to a specific response.

1. The total lead monitoring requirements are required 4/year in the Whole Effluent Toxicity (WET) tests. (See Comment 2 from Hollingsworth & Vose)

2. The total aluminum monitoring requirements are required 4/year in the Whole Effluent Toxicity (WET) tests and at a weekly frequency when aluminum is used in the treatment process. (See Comment 3 from Hollingsworth & Vose)

3. "Total metals" has been removed from the Whole Effluent Toxicity (WET) effluent limitations and monitoring requirements in the final permit. (See Comment 5(a) from Hollingsworth & Vose)

4. The final permit now correctly lists the pH monitoring requirement as a grab sample. (See Comment 5(b) from Hollingsworth & Vose)

In addition, the three following clarifications have been made to the permit:

5. The draft permit incorrectly states that zinc is measured at a frequency of 4/year. The final permit correctly states that zinc is measured at a frequency of 1/month and the average monthly and maximum daily total zinc effluent limits are 152 ug/L.

6. Permit footnote 1 should specify the sampling location. Therefore, the following description, which specifies the sampling location, has been added to the text of Footnote 1 in the final permit,

> The final effluent from Outfall 001 shall be sampled year-round for all parameters, at the point of discharge from the outlet of the final clarifier and prior to mixing with the river or any other discharges from the paper mill.

7. The "Freshwater Acute and Revised Chronic Toxicity Test Procedure and Protocol" states that "ideally, a grab sample of receiving water must be collected immediately upstream and outside of the influence of the outfall for use as dilution water in the tests." WET tests have been previously conducted with laboratory dilution water, but the ambient controls show that the receiving water does not appear to be toxic. Therefore, a footnote (Footnote 11) has been added to the final permit, which states, "Whole Effluent Toxicity (WET) testing will be conducted with the effluent and the receiving water, as described in Part IV 'Dilution Water' of the Freshwater Chronic and Modified Acute Toxicity Test Procedure and Protocol." In addition, Footnote 11 requires a map of the sampling location from which dilution water for Whole Effluent Toxicity (WET) testing is drawn.

8. The final permit reflects the change of mailing address for EPA Region 1.

I. Hollingsworth & Vose Comments on Draft NPDES Permit

Comment 1: Flow

Comment 1 (a):
"The footnote on page 3 of 6 of the draft permit states that the reporting requirement for flow includes the maximum and minimum daily flow rates and total flow for each operating date. We interpret this to mean that we will continue to report the daily flow for each operating date and that the maximum and minimum flow rate can be identified by looking at the list of daily rates for the month."

Response 1(a):
Hollingsworth & Vose is correct in its interpretation of Footnote 2 on page 3.

Comment 1(b):
"The average daily maximum flow rate on page 8 of 14 of the fact sheet and on page 3 of 6 of Appendix C, is actually 3.3 MGD and not 4.0 MGD based on the data listed in attachment C from 1/03 to 6/09. This will also make the acute dilution factor 1.2 rather than 1.0."

Response 1(b):
EPA agrees that the average daily maximum flow rate on page 8 of 14 of the fact sheet and on page 3 of 6 of the fact sheet Appendix C is 3.3 MGD. Therefore, the acute dilution factor is 1.2. The corrected acute dilution factor of 1.2 is used in Responses 2 and 3 below. In addition, even though the acute dilution factor may be used to calculate acute effluent limits for Whole Effluent Toxicity (WET) testing, the WET limit in the draft permit is based on EPA Region 1 and MassDEP policy that requires $LC_{50} \geq 100\%$ for discharge with dilution < 10:1. Since adjusting the dilution factor using the corrected maximum daily flow does not result in dilution > 10:1, no

change to the permit limit is warranted. Therefore, the acute (LC_{50}) limit of 100% stated in the draft permit is retained in the final permit.

Comment 2: Total Lead
"We do not use any raw materials, which contain lead. Although previous testing has detected lead a handful of times in 6.5 years, all but one of these results have been at the detection limit of 1.0 ug/l, making them just barely detectable. We should not be required to test for the metal, which is not used at the facility and has essentially been not detected all but once in 6.5 years."

Response 2:
Even though the facility has not historically used and does not currently use lead, the draft permit retains the lead requirements required in the current permit as a result of detectable levels of the metal in six (6) of seventy eight (78) samples from 2003 through 2009.

Regarding laboratory detection levels, the current permit requires lead analyses to be conducted with a method that has a detection level "as close to the calculated chronic limit as possible." A laboratory report dated 5/6/10 from Alpha Analytical Labs indicates the laboratory uses Inductively Coupled Plasma Mass Spectroscopy (ICP-MS) EPA Method 200.8 to analyze lead. The Reported Detection Limit (RDL) for measuring lead using Method 200.8 is 1 ug/L. This detection limit is sufficiently below the National Recommended Water Quality Criteria to evaluate if there is reasonable potential for the detected levels of lead to violate water quality standards.

Following Footnote E in the National Recommended Water Quality Criteria and a mean average effluent hardness of 95 mg/l as $CaCO_3$ at the facility since December 2007, the criteria for lead are calculated as follows. Please note that in the case of lead, water quality criteria must be adjusted based on hardness.

If:	Mass upstream + Mass discharge	= Mass downstream
	$Q_sC_s + Q_dC_d$	$= Q_rC_R$

Where: s = upstream, d = discharge, and r = downstream

Then: $C_r = [(C_d)(Q_d) + (C_sQ_s)]/Q_r$

Where:	C_r	= downstream receiving water concentration	= (solve)
	C_d	= average observed effluent concentration	= (from toxicity data)
	Q_d	= critical effluent flow	= monthly average flow
	C_s	= receiving water background concentration	= (from toxicity data)
	Q_s	= upstream receiving water flow	= 7Q10
	Q_r	$= Q_d + Q_s$	

The calculated value of the concentration of hardness downstream of the discharge in the receiving water is 46 mg/L based on the following calculations:

$$C_r = [(C_d)(Q_d) + (C_sQ_s)]/Q_r$$
$$= [(95 \text{ mg/L})\ (2.4 \text{ MGD}) + (18.3 \text{ mg./L})\ (4.1 \text{ MGD})]/(2.4 + 4.1 \text{ MGD})$$
$$= 47 \text{ mg/L}$$

Where:	C_d	= average observed effluent concentration	= 95 mg/L
	Q_d	= critical effluent flow	= 2.4 MGD
	C_s	= receiving water background concentration	= 18.3 mg/L
	Q_s	= upstream receiving water flow	= 4.1 MGD
	Q_r	= $Q_d + Q_s$	

Criterion Maximum Concentration (CMC):
CMC (dissolved) = exp {m_A [*ln*(hardness)]+ b_A} (CF)
CMC (dissolved) = exp {1.273 [*ln*(46 mg/L)]+ (-1.460)} (CF)
CMC (dissolved) = exp (3.41) (CF)
CMC (recoverable) = (exp (3.41) CF)/CF = 30.4 ug/L

Acute dilution factor (DF) = 1.2
CMC for lead = (30.4 ug/L) (1.2) = 37.5 ug/L

Criterion Continuous Concentration (CCC):
CCC (dissolved) = exp {m_C [*ln*(hardness)]+ b_C} (CF)
CCC (dissolved) = exp {1.273 [*ln*(46 mg/L)]+ (-4.705)} (CF)
CCC (dissolved) = exp (0.169) (CF)
CMC (recoverable) = (exp (0.169) CF) /CF = 1.18 ug/L

Chronic dilution factor (DF) = 1.7
CCC for lead = (1.18 ug/L) (1.7) = 2.1 ug/L

Based on the CMC and CCC criteria calculated above, EPA conducted a reasonable potential analysis of data from 2003 to 2009 using Appendix E of the Technical Support Document for Water Quality-based Toxics Control. Given a reported detection limit of 1 ug/L, the reasonable potential analysis is calculated as shown in Attachment A. The reasonable potential analysis demonstrates that the discharge does not have reasonable potential to exceed either the CMC or CCC. Based on these results, EPA is not requiring a water quality-based effluent limit for lead. Further, a review of sampling results from 2003 to 2009 demonstrates that all of the detectable levels of lead are below the CMC and CCC. Based on the review of new information, which was not available at the time of permit issuance in 2004, EPA is reducing the lead monitoring requirement from monthly to quarterly, as required in the WET tests.

Comment 3: Total Aluminum
"Although Aluminum sulfate is still used in the mill as a processing aid, total aluminum has not been detected in our effluent in the past 6.5 years. One total aluminum result was reported in May 2009, however it was reported incorrectly. Aluminum was detected in our river above sample and not in our effluent sample. A corrected DMR will be submitted. Our treatment plant process removes 100% of the aluminum used in the process. Therefore, we should not be required to test for a metal, which has not been detected for the last 6.5 years."

Response 3:
Even though aluminum is still added as a retention aid in the papermaking process, the facility has reported that the treatment plant process removes "100% of the aluminum" used in the process and the presence of aluminum was reported incorrectly. A laboratory report dated 5/6/10 from Alpha Analytical Labs indicates the laboratory uses Inductively Coupled Plasma-Atomic Emission Spectrometry (ICP-AES) EPA Method 200.7 to analyze aluminum. The Reported Detection Limit (RDL) for measuring aluminum using Method 200.7 is 100 ug/L. This detection limit is sufficiently below the limits based on the National Recommended Water Quality Criteria for aluminum, which is calculated as follows.

Criterion Maximum Concentration (CMC):
National Recommended Water Quality Criteria CMC = 750 ug/L
Acute dilution factor (DF) = 1.2
CMC for aluminum = (750 ug/L) (1.2) = 900 ug/L

Criterion Continuous Concentration (CCC):
National Recommended Water Quality Criteria CMC = 87 ug/L
Chronic dilution factor (DF) = 1.7
CCC for aluminum = (87 ug/L) (1.7) = 147.9 ug/L

Based on the CMC and CCC criteria calculated above, EPA conducted a reasonable potential analysis of data from 2003 to 2009 using Appendix E of the Technical Support Document for Water Quality-based Toxics Control. Given a reported detection limit of 100 ug/L, the reasonable potential analysis is calculated as shown in Attachment B. The reasonable potential analysis demonstrates that the discharge does not have reasonable potential to exceed the either the CMC or CCC. Based on this result, EPA is not requiring a water quality-based effluent limit for aluminum. Further, a review of the sampling aluminum sampling results from 2003 to 2009 demonstrates that all of detectable levels of aluminum were below the CMC and CCC. Based on the review of new information, which was not available at the time of permit issuance in 2004, the aluminum monitoring requirement is reduced from monthly to quarterly, as required in WET tests.

The permittee is, however, also required to monitor aluminum weekly when it is used in the treatment process. Since the time Hollingsworth & Vose submitted this comment, the facility experienced an upset when it returned to service after the clarifier was inspected during the annual plant shutdown. In order to stabilize the treatment process, ferric chloride chemical addition was supplemented with aluminum sulfate. As reported by the facility in a letter dated September 15, 2010, "On August 19th, we began using aluminum sulfate in place of ferric chloride to treat our water and we continue with this treatment today." Therefore, in cases of emergency, if and when aluminum chemical addition is used, the permittee must monitor and report aluminum at a weekly frequency.

Comment 4: Total Zinc
"We completed a site-specific water quality criteria study for zinc in 2005 and submitted it to DEP and EPA in January 2006. The results of this study support a less stringent site-specific criterion for zinc in our discharge. It is our understanding that DEP is moving forward with

proposing these less stringent site-specific criteria for zinc in 2010. Therefore, we should not be subject to a lower zinc limit that is not based on site-specific water quality criteria, since this data has been available since 2006. A reasonable solution would be to continue monitoring only for zinc as per the order issued by EPA in 2005, until DEP completes its proposal for less stringent water quality criteria."

Response 4:
MassDEP is currently reviewing the Site Specific Water Quality Criteria (SSWQC) submitted by Hollingsworth & Vose. However, unless and until MassDEP establishes new site specific criteria, incorporates them into the Surface Water Quality Standards during the next triennial revision, and EPA approves the criteria to revise the standards, then the existing criteria must be the basis for establishing effluent limits. As discussed in the fact sheet, DMR data collected between 2003 and 2009 clearly demonstrate a reasonable potential to cause or contribute to a violation of the zinc criteria. Given a reported detection limit of 5 ug/L, the reasonable potential analysis is calculated as shown in Attachment C. The final permit, therefore, maintains the average monthly and maximum daily effluent limits of 152 ug/L that are contained in the current permit in order to ensure that water quality standards are satisfied.

In addition, based on current information, the anti-backsliding requirements (40 CFR §122.44(l)) and Section 402 (o) of the Clean Water Act would prevent elimination of the zinc limits. We recognize that since February 2006, zinc effluent concentration levels have been consistently below the 152 ug/L limits, most likely due to the facility increasing pH. Therefore, recent data suggests that the facility will likely achieve the effluent limits stated in the final permit.

Comment 5: Other
Comment 5(a):
"There is a typo on page 2 of 6 of the draft permit. "Total metals" should not be added to the effluent limit requirements. This is a title heading in the WET protocols, not a criterion to be tested for."

Response 5(a):
"Total metals" has been removed from the Whole Effluent Toxicity (WET) effluent limitations and monitoring requirements in the final permit. The Whole Effluent Toxicity (WET) effluent limitations and monitoring requirements are now correctly described in the final permit and in Attachment A: Freshwater Chronic and Modified Acute Toxicity Test Procedure Protocol.

Comment 5(b):
"pH should be a grab sample and not a composite sample in page 2 of the draft permit."

Response 5(b):
The final permit now correctly lists the pH monitoring requirement as a grab sample.

Comment 5(c):
"There is a typo in page 8 of 14 of the fact sheet in the second paragraph, "ferric" chloride is added to treat the effluent."

Response 5(c):
Hollingsworth & Vose provided the above comment on the fact sheet for the draft permit. On page 8 of 14, the fact sheet states that "chloride" is included in the chemical conditioning process of wastewater from the aeration lagoon. "Chloride" should be changed to "ferric chloride," however when issuing a final permit, EPA does not modify the fact sheet that was produced in conjunction with the draft permit. Thus, the modification of "chloride" stated in the fact sheet to "ferric chloride" is acknowledged in this response to comments.

Attachment A: Reasonable Potential Analysis for Lead

Daily Maximum Concentration Derivation		
uy = Avg of Nat. Log of daily discharge *(ug/l)* =	0.02063	
sy = Std Dev. of Nat Log of daily discharge =	0.18223	
S (yi - *uy)2* =	0.02597	
k = number of daily samples =	78	
sy2 = estimated variance = (S[(yi - *uy)2])* / (k-1) =	0.00034	
Daily Max Concentration = exp (uy + 2.326*sy)		
Daily Max Concentration=	**1.56**	**ug/L**
(Log normal distribution, 99th percentile)		
Average Monthly Concentration Derivation		
Number of samples per month, n =	1.00	
E(x) = Daily Avg = exp(uy + 0.5 sy2) =	1.02102	
V(x) = Daily Variance = exp(2uy + sy2) * [exp(sy2) - 1] =	0.00035	
E(Xn) = E(x)	1.02102	
V(Xn) = V(x)/n	0.00035	
Monthly Average Concentration = E(Xn) + 1.645[V(Xn)]^(1/2)		
Monthly Avg Concentration =	**1.05**	**ug/L**
(Log normal distribution, 95th percentile)		

Attachment B: Reasonable Potential Analysis for Aluminum

Daily Maximum Concentration Derivation		
uy = Avg of Nat. Log of daily discharge *(ug/l)* =	4.62690	
sy = Std Dev. of Nat Log of daily discharge =	0.09236	
S (yi - *uy)2* =	0.65678	
k = number of daily samples =	78	
sy2 = estimated variance = (S[(yi - *uy)2])* / (k-1) =	0.00853	
Daily Max Concentration = exp (uy + 2.326*sy)		
Daily Max Concentration=	**126.69**	**ug/L**
(Log normal distribution, 99th percentile)		
Average Monthly Concentration Derivation		
Number of samples per month, n =	1.00	
E(x) = Daily Avg = exp(uy + 0.5 sy2) =	102.63335	
V(x) = Daily Variance = exp(2uy + sy2) * [exp(sy2) - 1] =	90.23158	
E(Xn) = E(x)	102.63335	
V(Xn) = V(x)/n	90.23158	
Monthly Average Concentration = E(Xn) + 1.645[V(Xn)]^(1/2)		
Monthly Avg Concentration =	**118.26**	**ug/L**
(Log normal distribution, 95th percentile)		

Attachment C: Reasonable Potential Analysis for Zinc

Daily Maximum Concentration Derivation		
uy = Avg of Nat. Log of daily discharge *(ug/l)* =	4.08765	
sy = Std Dev. of Nat Log of daily discharge =	0.89167	
S (yi - *uy)2* =	61.22023	
k = number of daily samples =	78	
sy2 = estimated variance = (S[(yi - *uy)2])* / (k-1) =	0.79507	
Daily Max Concentration = exp (uy + 2.326*sy)		
Daily Max Concentration =	**474.22**	**ug/L**
(Log normal distribution, 99th percentile)		
Average Monthly Limit Derivation		
Number of samples per month, n =	1.00	
E(x) = Daily Avg = exp(uy + 0.5 sy2) =	88.69334	
V(x) = Daily Variance = exp(2uy + sy2) * [exp(sy2) - 1] =	9554.59555	
E(Xn) = E(x)	88.69334	
V(Xn) = V(x)/n	9554.59555	
Monthly Average Concentration = E(Xn) + 1.645[V(Xn)]^(1/2)		
Monthly Avg Concentration =	**249.49**	**ug/L**
(Log normal distribution, 95th percentile)		