

S P O K A N E C O U N T Y



UTILITIES DIVISION
N. Bruce Rawls, P.E., Utilities Director

A DIVISION OF THE PUBLIC WORKS DEPARTMENT

November 28, 2007

Mr. Dave Mandyke
Acting Director
Spokane Public Works and Utilities
808 W. Spokane Falls Blvd.
Spokane, WA 99201-3334

Re: Spokane County 2006 Draft Wastewater Facilities Plan Amendment
City of Spokane Comments on the County December 2006 Addendum To:
2002 Regional Wastewater Treatment Plant SEIS
2002 Wastewater Facilities Plan EIS

Dave:
Dear Mr. Mandyke:

We drafted this letter in July, and have realized during the finalization of our Facilities Plan Report that the letter was not finalized or mailed.

Thank you for your letter dated March 7, 2007, containing the City of Spokane's comments to Spokane County's Draft 2006 Wastewater Facilities Plan Amendment. This letter responds to each of the City's comments and, for ease of reference, our response follows the same format of the City's comment letter:

- 1) Page 2-10, 2nd to last bullet: "that Flows are approaching a Peak of 10.5 MG.

Based on City/County agreements, the County is allowed 10 MGD. Peaks are to be addressed on the County's side of the collection system.

Spokane County's interpretation of the City/County Agreement is that the County is allowed an average annual flow of 10 MGD and that peaks greater than 10 MGD may be conveyed to the Riverside Park Water Reclamation Facility. Spokane County acknowledges and understands that the Agreement, as amended, provides specific capacity limitations regarding peak flows in the City interceptors downstream from the County connection points.

- 2) Page 2-14, first full paragraph: "Ability to operate the membrane filters and address flows greater than the County wants to design for" [apparent intent is to offload these added flows to the City of Spokane system]

Located at: 1026 W. Broadway, 4th Floor
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Mr. Dave Mandyke
Spokane Public Works and Utilities
November 28, 2007
Page 2

The County is allowed a total of 10 MGD from the 3 connection points. The total cannot exceed 10 MGD. Any wastewater that is sent or off loaded into the City system must be of Standard Strength Sewage and meet applicable discharge limits of the City's Pretreatment and Sewer Use ordinances. An intention to Off load certain amounts of Flow may require the Industries hooked to this County Plant to ALSO have to meet the City's Pretreatment Standards. This requires added legal/regulatory review.

Spokane County's intent is to divert a portion of the flow from the North Valley Interceptor and Spokane Valley Interceptor to the Spokane County Regional Water Reclamation Facility (SCRWRF). These diversions will be designed to proportionally split the flow in the County's interceptors. The result will be that the County will continue to send "standard strength sewage" to the Riverside Park Water Reclamation Facility, and will continue to follow the applicable discharge limits of the City and County's pretreatment programs.

3) Route of SVI as depicted in figure 3-3 top map:

The Havana corridor is not available for routing the Spokane Valley Interceptor to the new plant site. No provisions have been made in the Bridging the Valley – Havana Bridge project for this to occur. With rerouting existing major City utilities and the bridge itself, use of this right of way is not longer available. Alternative routing is required.

At the time the 2006 Draft Wastewater Facilities Plan was prepared, the alignment of the SVI forceman to the SCRWRF had not been finalized. This alignment is still evolving through extensive coordination meetings with City staff in the Water and Wastewater Departments. Your comment is noted.

4) Page 3-8, 5th paragraph, last line: "For additional discussion, see Section 3.4."

As you know from previous correspondence, the City believes County studies indicate a slight increase in risk to City drinking water quality with the River discharge located on the Rebecca Street alignment (the risk would be greater with an aquifer discharge). So the referenced section here was of interest to us, but it appears to have been left out of the addendum.

There is no mention of the words "for additional discussion, see Section 3.4" in the published 2006 Draft Wastewater Facilities Plan Amendment. We believe that your comment refers to the first full paragraph on Page 3-7, and not Page 3-8 as noted in the comment letter.

Nonetheless, the paragraph on Page 3-7 mentions, "A detailed risk assessment was performed to address potential concerns associated with downstream water supplies. The study concluded that all public health risks would be addressed by

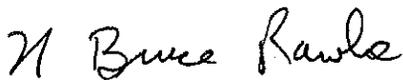
Mr. Dave Mandyke
Spokane Public Works and Utilities
November 28, 2007
Page 3

a combination of treatment and aquifer attenuation, along with supplemental monitoring and a contingency plan for additional disinfection contact time at the City wells. Additional protection against viral contamination can be provided by the use of chlorine disinfection, which is proposed for the Spokane County Regional Water Reclamation Facility.”

This risk assessment was shared with the City of Spokane, and the County met with City Staff on August 30, 2006 to discuss this issue. As a result, the County moved forward with a shift away from UV disinfection, to chlorine disinfection, due to the added benefits of a higher level of viral inactivation.

Thank you for the time that you have invested in meeting with us and in preparing your review comments. We will incorporate your comments and this response letter into the Revised Final Draft 2006 Wastewater Facilities Plan Amendment for final submittal to Ecology.

Sincerely,
SPOKANE COUNTY



N. Bruce Rawls, P.E.
Spokane County Utilities Director

Cc: Richard Koch, (Water Quality Section)
Dave Moss, P.E. (Spokane County Public Utilities)
David L. Clark, P.E. (HDR Engineering, Inc.)
Dale Arnold (City of Spokane)
Brad Blegen (City of Spokane)
John Mercer (City of Spokane)
Lloyd Brewer (City of Spokane)





STATE OF WASHINGTON
DEPARTMENT OF ECOLOGY

4601 N Monroe Street • Spokane, Washington 99205-1295 • (509) 329-3400

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OCT 17 2007

SPOKANE COUNTY UTILITIES

October 11, 2007

Mr. N. Bruce Rawls, P.E.
Utilities Division
Spokane County Public Works Dept.
1026 West Broadway
Spokane, WA 99260-0430

Dear Mr. Rawls:

RE: Spokane County Wastewater Facilities Plan Amendment
Response to Comments

The department has reviewed the County's response to Ecology's comment on the revised final draft of the Wastewater Facilities Plan. The response is satisfactory with exception of the TSS. For TSS in table 2-8 it would be better to note that a TSS limit will be based on performance data obtained after stable water reclamation operations have been achieved. It would also be useful to note that vendor supplied performance data on membrane performance suggests that a TSS less than 5 mg/L is a reasonable expectation.

If you have further questions, please don't hesitate to contact me at (509) 329-3519.

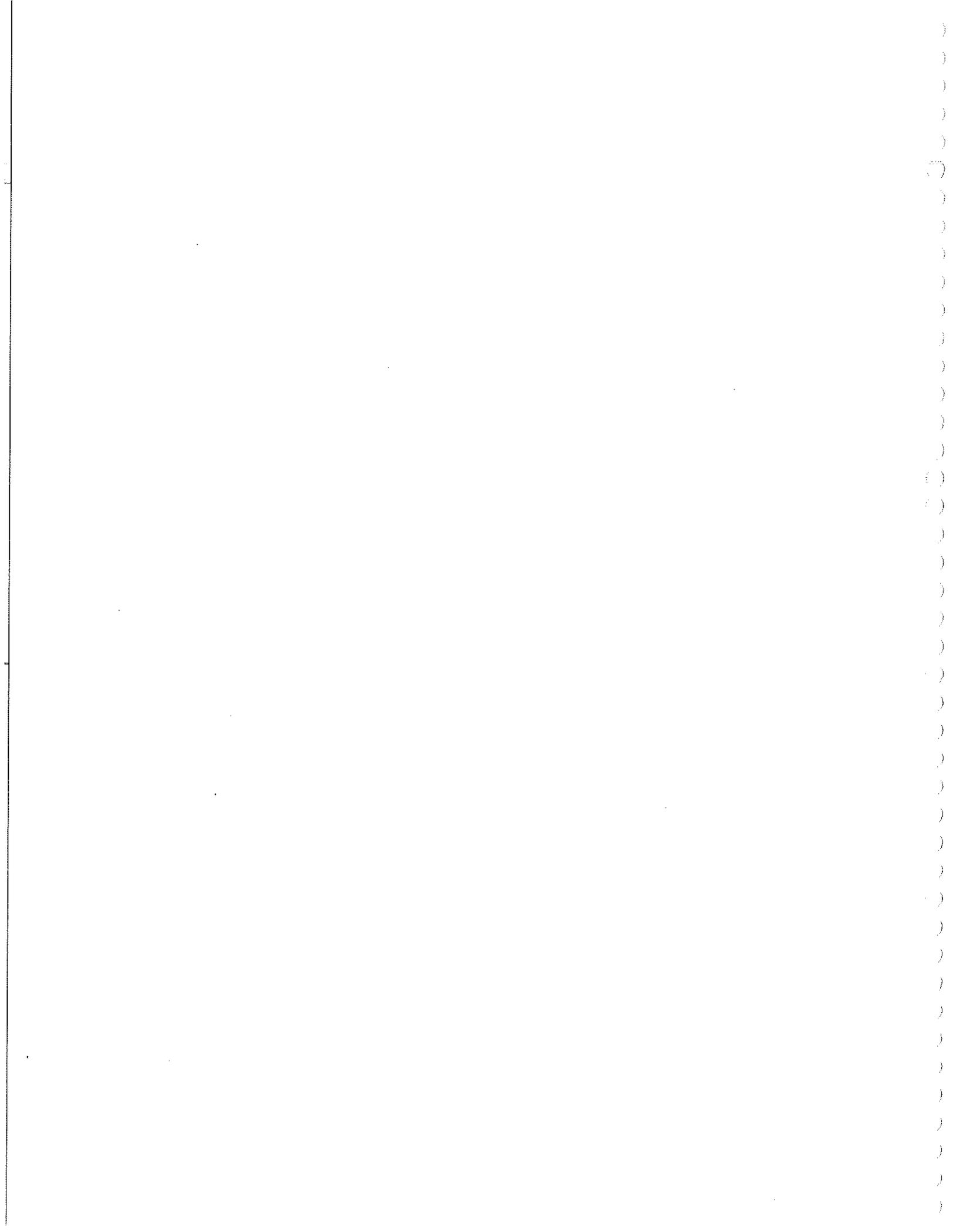
Sincerely,

Richard A. Koch, P.E.
Water Quality Section

RAK:dw

cc: Dave Clark, P.E.; HDR Engineering Inc.
Dave Moss, P.E. Spokane Co. Utilities





S P O K A N E C O U N T Y



UTILITIES DIVISION
N. Bruce Rawls, P.E., Utilities Director

A DIVISION OF THE PUBLIC WORKS DEPARTMENT

October 4, 2007

Mr. Richard A. Koch, P.E.
Water Quality Section
Washington State Department of Ecology
4601 North Monroe Street
Spokane, WA 99205-1295

Subject: Spokane County Wastewater Facilities Plan Amendment
Revised Final Draft dated July 2007 - Response to Review Comments

Dear Mr. Koch:

Spokane County has received the comment letter from the Department of Ecology dated September 6, 2007 with comments to assist in the completion of the facilities planning process. This letter addresses each comment from the Department of Ecology (reiterated in italics) and the corresponding response from Spokane County follows.

"The revision gives projected CBOD of less than 25 mg/L and less than 3 mg/L ammonia. The most current model run results are that at the end of pipe CBOD_{ult} needs to be less than 1.13 mg/L. So, CBOD₅ should be less than 2 mg/L."

Table 2-8 in the draft 2006 Wastewater Facilities Plan, which summarizes anticipated NPDES permit requirements, will be revised to reflect a CBOD a seasonal average effluent limit of 2 mg/L. A seasonal average is provided for in the Foundational Concepts for nutrients of concern, as noted in the Ecology comment below on ammonia limits. An excerpt of table modifications is attached to this letter for review. It should be noted that the detection limit for BOD is 2 mg/L in the *Standard Methods for the Examination of Water and Wastewater*:

5210 Biochemical Oxygen Demand (BOD) Section 6.b. Working range and detection limit:

The working range is equal to the difference between the maximum initial DO (7 to 9 mg/L) and minimum DO residual of 1 mg/L multiplied by the dilution factor. A lower detection limit of 2 mg/L is established by the requirement for a minimum DO depletion of 2 mg/L.

"The model also predicts that ammonia at 0.026 mg/L in the receiving water below the outfall would have no discernible impact on the dissolved oxygen in Lake Spokane (change <0.01 mg/L DO). The model has been rerun for the purpose of assessing the response of the Lake Spokane DO, it does not appear that minor variations in the discharge ammonia loadings have noticeable impacts on DO in Lake Spokane. For the purposes of demonstrating compliance with future

permit conditions, the Foundational Concepts offer the opportunity to consider averaging over the season.”

As we discussed in our September 20, 2007 meeting with Ecology, the modeling scenarios attached to your letter of September 6, 2007 are problematic from a treatment process standpoint for a number of reasons, and are not necessary to be protective of DO in Lake Spokane during the shoulder season months. Cooler wastewater temperatures early and late in the phosphorus control season may present challenges when attempting effluent ammonia as low as 0.25 mg/L. As we presented in the September 20th meeting, CE-QUAL-W2 modeling of the Spokane River shows that alternative ammonia limits in the spring and fall of the year are still protective of D.O. in Lake Spokane. The attached excerpt of Table 2-8 presents suggested ammonia limits for your review based on a seasonal average in three periods to alleviate some of the concerns associated with daily treatment process performance variations skewing monthly averages, while still meeting the DO objectives of the TMDL:

- April/May: Seasonal average over 61 day period (mass discharge based on 1.0 mg/L effluent ammonia)
- June/July/August/September: Seasonal average over 122 day period (mass discharge based on 0.25 mg/L effluent ammonia)
- October: Seasonal average over 31 day period (mass discharge based on 1.0 mg/L effluent ammonia)

Based on preliminary CE-QUAL-W2 modeling of the river, this scenario appears to meet the <0.01 mg/L target selected by Ecology as having “no discernible impact on dissolved oxygen in Lake Spokane.” Averaging effluent performance over a longer seasonal period when the ammonia target is lowest (0.25 mg/L) will help prevent normal variations in treatment performance from unnecessarily creating violations of limits. In addition, the modeling indicates that the dissolved oxygen in Lake Spokane is not sensitive to short term variations of ammonia loading, but is more sensitive to seasonal averages of Ammonia loading.

“Enclosed are three scenarios the model considered. Also enclosed are calculations of possible average monthly limits and maximum daily limits based on the third scenario.”

As we discussed in our September 20, 2007 meeting with Ecology meeting, the maximum daily limits in the tables attached to your letter of September 6, 2007 are very restrictive (0.779 mg/L to 1.6 mg/L). These maximum daily values may not be met, even in a very well designed and operated nitrification facility due to normal variations in wastewater influent and biological treatment performance. As we presented in the September 20th meeting, CE-QUAL-W2 modeling of the Spokane River shows that daily variations in a log normally distributed effluent ammonia data set (Mean of 1.0 mg/L, Cv of 0.6, variation range 0.1 to 4 mg/L) impact D.O. in Lake Spokane no differently than a constant ammonia effluent of 1.0 mg/L. Therefore, daily limits for ammonia

should be set based on acute and chronic toxicity, along with consideration of DO in river segments downstream from the discharge. The recommended daily limits for ammonia on the attached table are based on toxicity for the winter and the months of April, May, and October. For the months of June-September, the recommended daily limit for ammonia is based on dissolved oxygen limitations in the Spokane River upstream from the City of Spokane water reclamation facility, which were established using the CE-QUAL-W2 model.

"The implementation plan in Chapter 10 doesn't list the construction storm water general permit."

Chapter 10 text of the draft 2006 Wastewater Facilities Plan Amendment will be modified to reflect the construction storm water general permit. It is anticipated that the DBO Company will make an application and request a waiver from permit coverage for construction of the water reclamation facility, because there is no possibility that stormwater from the site could reach surface waters. Construction stormwater general permit coverage will likely be needed for construction of the outfall, which is being delivered under a separate construction project.

"In Appendix B, the final paragraph of page 7 carrying over to page 8 gives two example of P loading. One is a drainfield of 1,200 ft². The other is an irrigated field receiving 12 inches of irrigation water. The paragraph ends "...likely higher than this example." Which example? Please clarify the comparison."

Appendix B text of the draft 2006 Wastewater Facilities Plan Amendment will be edited to provide the clarification. The text was intended to show that septic system loadings of phosphorus are much higher than agricultural lands with typical fertilizer applications which are known to result in phosphorus loadings to groundwater. The assumed drainfield size of 1,200 ft² used for the loading comparison is actually larger than many existing drainfields in the Spokane Valley. This information was presented in the report to demonstrate that actual septic phosphorous loadings in the Spokane Valley could be even greater than those assumed in this example comparison.

"On page 13 of Appendix B, the aquifer flow is described as turning north and northwest of the city limits. May I suggest clarifying that to "west of the eastern city limits....." "

Appendix B text of the draft 2006 Wastewater Facilities Plan Amendment will be edited as suggested.

"On page 33 of Appendix B, the evidence given in Table 7 doesn't make a strong case for an increasing TP concentration trend over time in Ecology's opinion. Also, the ratio of TP to Ortho-P is highly variable suggesting reactions or sources we don't know much about. Submission of that additional insight can be delayed somewhat, however."

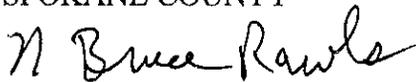
Historical groundwater monitoring was not originally designed to provide for phosphorus trend analysis, or to support some of the issues currently under consideration as related to the TMDL. The data in Table 7 represents available information from historical monitoring efforts, and there appear to be some discrepancies in the data between total phosphorus and ortho-phosphorus in 2003. The data available for groundwater phosphorus concentrations have limitations which the County is reviewing with the intent of improving the quality of the information from future monitoring efforts. This will improve the usefulness of future groundwater information to better support water quality management, and the TMDL.

“The report utilizes flow information that presumably matches the flow data used in the computer model for the Spokane River DO TMDL. However, in general it now appears that the new data from USGS’s June 2007 report will revise the flow rates for the aquifer significantly upwards. So, the mass of P carried to the river by the aquifer is again likely underestimated by the current estimates in Appendix B. Future monitoring will hopefully provide more robust estimates of controllable P removal through septic tank elimination.”

Appendix B text (page 32) provides a generalized summary of average volumetric flow in the aquifer and associates that flow with the mean groundwater concentration of phosphorus from 2003 to provide an estimate of the total mass of phosphorus in groundwater. A higher aquifer flow rate associated with the same groundwater concentration would suggest a higher total mass of phosphorus in the aquifer. Note that the septic phosphorus loading estimates for delta elimination presented in Appendix B are not based on aquifer flow assumptions. The total aquifer mass of phosphorus was only presented as a reference point for comparison of loadings.

We appreciate the opportunity to discuss the issues associated with the ammonia scenarios with Ecology, as suggested in your letter. Please call if you have questions or if you would like to discuss any of the responses to the review comments. As soon as you reach a conclusion regarding the proposed limits presented in this letter, we would like to get your response, so we can make the final revisions to the draft 2006 Wastewater Facilities Plan Amendment, for submittal to you, and for Ecology approval.

Sincerely,
SPOKANE COUNTY



N. Bruce Rawls, P.E.
UTILITIES DIRECTOR

Cc: Dave Moss, P.E. (Spokane County Utilities)
David Clark, P.E. (HDR Engineering, Inc.)
Lori Terry, (Foster Pepper)



STATE OF WASHINGTON
DEPARTMENT OF ECOLOGY

4601 N Monroe Street • Spokane, Washington 99205-1295 • (509)329-3400

September 6, 2007

Mr. N. Bruce Rawls, P.E.
Utilities Division
Spokane County Public Works Dept.
1026 W. Broadway
Spokane, WA. 99260-0430

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SEP - 7 2007

SPOKANE COUNTY UTILITIES

Dear Mr. Rawls:

RE: Spokane County Wastewater Facilities Plan Amendment
Revised Final Draft of July 2007

The revised final draft Wastewater Facilities Plan has been reviewed and Ecology has a number of comments to assist in the completion of this portion of the Facilities Planning process.

The revision gives projected CBOD of less than 25 mg/L and less than 3 mg/L ammonia. The most current model run results are that at the end of pipe CBOD_{ult} needs to be less than 1.13 mg/L. So, CBOD₅ should be less than 2 mg/L.

The model also predicts that ammonia at 0.026 mg/L in the receiving water below the outfall would have no discernible impact on the dissolved oxygen in Lake Spokane (change <0.01 mg/L DO). The model has been rerun for the purpose of assessing the response of the Lake Spokane DO, it does not appear that minor variations in discharge ammonia loadings have noticeable impacts on DO in Lake Spokane. For the purposes of demonstrating compliance with future permit conditions, the Foundational Concepts offer the opportunity to consider averaging over the season.

Enclosed are three scenarios the model considered. Also enclosed are calculations of possible average monthly limits and maximum daily limits based on the third scenario.

The implementation plan in Chapter 10 doesn't list the construction storm water general permit.

In appendix B, the final paragraph of page 7 carrying over to page 8 gives two example of P loading. One is a drainfield of 1,200 ft². The other is an irrigated field receiving 12 inches of irrigation water. The paragraph ends "...likely higher than this example." Which example? Please clarify the comparison.

On page 13 of appendix B, the aquifer flow is described as turning north and northwest of the city limits. May I suggest clarifying that to "west of the eastern city limits..."



**INSERT REVISIONS TO WASTEWATER FACILITIES PLAN -- Table 2-8.
Potential Effluent Quality Requirements for Discharge to the Spokane River**

Parameter	Summer Permit Season (April – October)			Winter Permit Season (November – March)		
	Seasonal Average Limit	Weekly Average	Daily Limit	Seasonal Average Limit	Weekly Average	Daily Limit
CBOD ₅ , mg/L ^a	2	-	-	<25	<40	-
Total Suspended Solids, mg/L	30	45	-	30	45	-
Nitrate-Nitrogen, mg/L ^b	-	-	-	-	-	-
Phosphorus Requirements	Seasonal Average Limit	Weekly	Daily	Seasonal Average Limit	Weekly	Daily
Total Phosphorus (April – October), mg/L ^c	0.010	Report	Report	-	-	-
Total Phosphorus (April – October) lbs/day ^c	0.67	Report	Report	-	-	-
Total Phosphorus (Nov - March)	-	-	-	Report	Report	Report
Ammonia Requirements^f	Seasonal Average Limit	Weekly	Daily	Seasonal Average Limit	Weekly	Daily
Ammonia-Nitrogen (April, May) lbs/day	66.72	-	-	-	-	-
Ammonia-Nitrogen (April, May) mg/L ^g	-	-	16	-	-	-
Ammonia-Nitrogen (June, July, August, September) lbs/day	16.68	-	-	-	-	-
Ammonia-Nitrogen (June, July, August, September) mg/L ^g	-	-	8	-	-	-
Ammonia-Nitrogen (October) lbs/day	66.72	-	-	-	-	-
Ammonia-Nitrogen (October) mg/L ^g	-	-	16	-	-	-
Ammonia-Nitrogen (November - March), mg/L ^g	-	-	-	Report	Report	21

^a The Draft TMDL includes a draft Wasteload Allocation for CBOD, ammonia nitrogen, and phosphorus. Future discharge permit revisions are expected to include performance based limits. The Managed Implementation Plan (MIP) calls for NPDES limits based on seasonal average values and CBOD limits will be calculated on an average seasonal basis from April through October.

^b The County has elected to reduce effluent nitrate-nitrogen levels during the summer permit season to a concentration of 10 mg/L or less.

^c Not used (reserved for use in Wastewater Facilities Plan Table 2-8)

^d Not used (reserved for use in Wastewater Facilities Plan Table 2-8)

^e The Managed Implementation Plan (MIP) calls for NPDES limits based on seasonal average values. The MIP targets of 10 µg/L total phosphorus are expressed as pounds of phosphorus discharged to the River based on the discharge volume estimates established through the TMDL Collaboration. The MIP projected flow for Spokane County for 2017 is 8 mgd and for 2027 is 8 mgd. The total phosphorus Wasteload Allocation (WLA) for Spokane County for 2017 is 0.67 lbs/day and for 2027 is 0.67 lbs/day. Compliance in meeting the pounds of phosphorus target will be achieved by a combination of phosphorus removal treatment technology and implementation of other phosphorus reduction actions that together result in the net pounds of phosphorus discharged to the River being equal to, or less than, the target pounds. SCRWRFF effluent concentration and loading limits for April-October are based effluent total phosphorus <0.050 mg/L combined with other phosphorus reduction actions to meet the Managed Implementation Plan (MIP) targets of 10 µg/L total phosphorus.

^f The Managed Implementation Plan (MIP) calls for NPDES limits based on seasonal average values and ammonia limits will be calculated based on the following: April/May (61 day average), June/July/August/September (122 day average), and October (31 day average).

^g The daily limits for ammonia are based on effluent mixing zone toxicity control, except during June-September when the daily limits are controlled by dissolved oxygen limitations at compliance locations in the Spokane River upstream of Lake Spokane.

SCENARIO 1

	mgd	Ammonia mg/L	Ammonia lbs/day	Max DO deficit mg/L
City Spokane	37.0	0.300	92.57	
IEPC	4.3	0.300	10.76	
Kaiser	15.7	0.300	39.28	
Liberty Lake	0.6	0.300	1.58	
2001 total mgd			144.19	0.0106

SCENARIO 2

	mgd	Ammonia mg/L	Ammonia lbs/day	Max DO deficit mg/L
City Spokane	37.0	0.200	61.72	
IEPC	4.3	1.000	35.86	
Kaiser	15.7	0.100	13.09	
Liberty Lake	0.6	0.200	1.05	
2001 total mgd	57.6		111.72	0.0072

2017 Target Ammonia NPDES PERMIT (lbs/day)*

	mgd	Ammonia mg/L	Ammonia lbs/day	Max DO deficit mg/L
City Spokane	41.8	0.250	87.07	
IEPC	4.1	1.000	34.19	
Kaiser	15.4	0.100	12.84	
Liberty Lake	1.4	0.250	2.94	
Spokane Co.	8.0	0.250	16.68	
2017 total mgd	70.7		137.05	<0.0100

* 2027 Target lbs/day ammonia discharge should be the same as 2017

Statistical variables for permit limit calculation

Average Monthly Limit (AML) ug/L	Maximum Daily Limit (MDL) ug/L	Limiting LTA ug/L	Coeff. Var. (CV) decimal	AML Prob'y Basis decimal	MDL Prob'y Basis decimal	# of Samples per Month n
345.4	778.6	250.0	0.60	0.95	0.99	8.00
455.9	1027.8	330.0	0.60	0.95	0.99	8.00
690.7	1557.2	500.0	0.60	0.95	0.99	8.00

Mr. N. Bruce Rawls, P.E.
September 6, 2007
Page 2

On page 33 of appendix B, the evidence given in table 7 doesn't make a strong case for an increasing TP concentration trend over time in Ecology's opinion. Also, the ratio of TP to Ortho-P is highly variable suggesting reactions or sources we don't know much about. Submission of that additional insight can be delayed somewhat, however.

The report utilizes flow information that presumably matches the flow data used in the computer model for the Spokane River DO TMDL. However, in general it now appears that the new data from USGS's June 2007 report will revise the flows rates for the aquifer significantly upward. So, the mass of P carried to the river by the aquifer is again likely underestimated by the current estimates of appendix B. Future monitoring will hopefully provide more robust estimates of controllable P removal through septic tank elimination.

Because of the ammonia concerns previously shared by the County we invite you to further discuss with us your concerns and invite you to bring any additional ammonia scenarios your consultant has considered. We would also appreciate discussing a conditional approval letter. Please don't hesitate to contact me at (509) 329-3519.

Sincerely,



Richard A. Koch, P.E.
Water Quality Section

RAK:dw

Encl. Ammonia Scenarios from Bob Cousimano
cc/enc: Dave Clark, P.E.; HDR Engineering Inc.
Dave Moss, P.E. Spokane Co. Utilities



UTILITIES DIVISION
N. Bruce Rawls, P.E., Utilities Director

A DIVISION OF THE PUBLIC WORKS DEPARTMENT

July 24, 2007

Richard Koch
Washington State Department of Ecology
4601 N. Monroe
Spokane, WA 99205

**SUBJECT: SPOKANE COUNTY 2006 WASTEWATER FACILITIES PLAN
AMENDMENT-REVISED FINAL DRAFT**

Dear Richard:

Attached are two copies of the revised final draft of our facilities plan amendment (FPA) for your review and approval. In this FPA document, we have responded to all of the review comments on the draft which was submitted to you in December 2006. Appendix F in this FPA includes copies of the comment letters and our replies. The text in the FPA has been revised accordingly.

Major revisions were made to Chapter 11 and Appendix B, to address comments and concerns expressed by Ecology. These sections of the FPA now provide a comprehensive Delta Elimination Plan, as required by the *Foundational Concepts for the Spokane River TMDL Managed Implementation Plan*.

We look forward to your approval of this FPA, so that we can continue with the process of building this new regional water reclamation facility. Approval of the FPA is necessary now to provide assurances to the Design Build Operate firms that the performance targets for this plant are known and predictable when they bid the project.

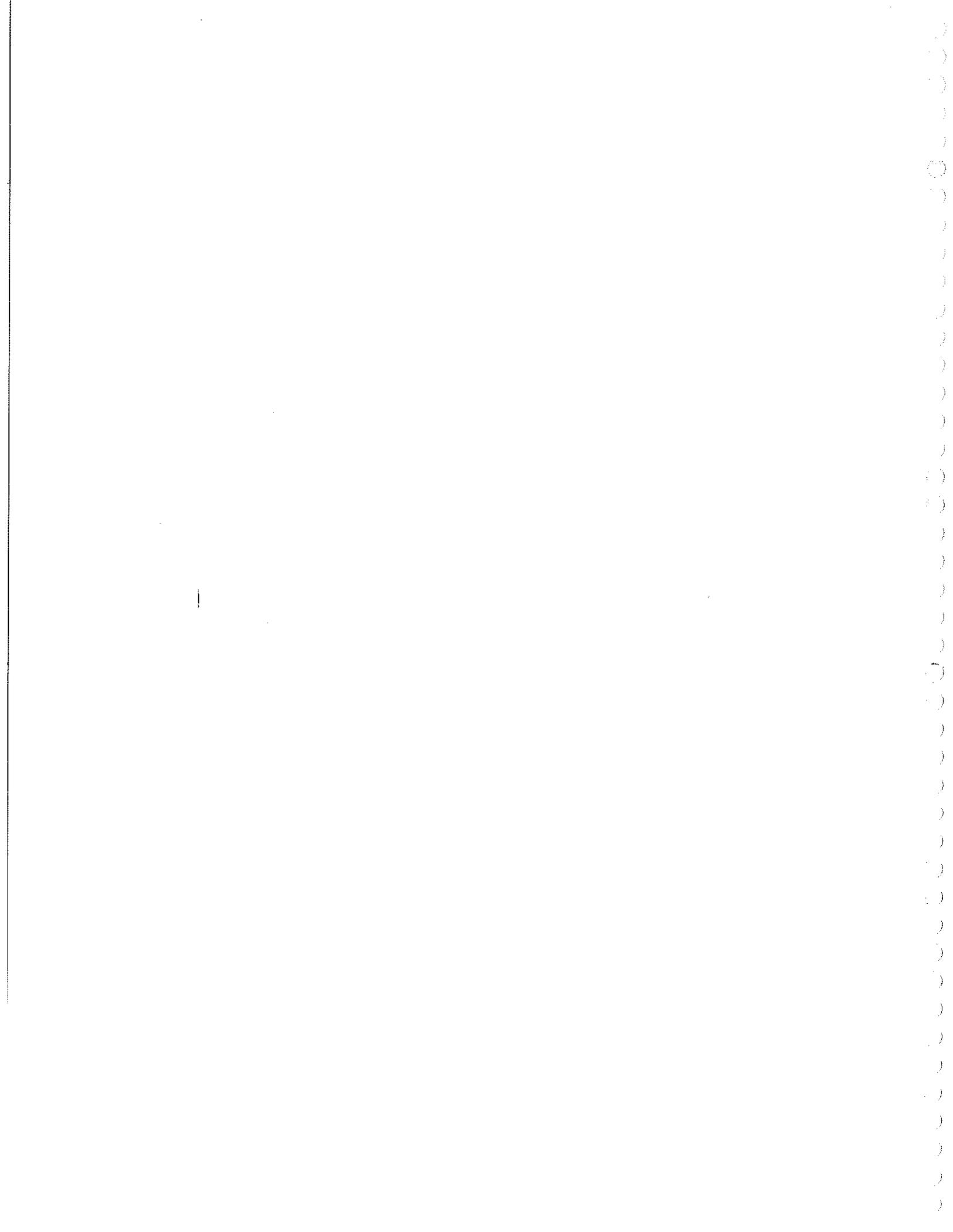
If you have any questions or concerns regarding the revised final draft, please call me at 477-7289.

Sincerely,

A handwritten signature in black ink that reads 'N Bruce Rawls'. The signature is written in a cursive, slightly slanted style.

N. Bruce Rawls, P.E.
Spokane County Utilities Director

CC: Dave Moss, Spokane County Water Reclamation Manager
Dave Clark, HDR Engineers
Craig Riley, Department of Health (1 copy)



S P O K A N E C O U N T Y



UTILITIES DIVISION
N. Bruce Rawls, P.E., Utilities Director

A DIVISION OF THE PUBLIC WORKS DEPARTMENT

July 20, 2007

Richard Koch
Washington State Department of Ecology
4601 N. Monroe
Spokane, WA 99205

SUBJECT: SPOKANE COUNTY TECHNOLOGY SELECTION PROTOCOL-RELEVANT TO THE EPA REPORT TITLED "ADVANCED WASTEWATER TREATMENT TO ACHIEVE LOW CONCENTRATION OF PHOSPHORUS", APRIL 2007

Dear Richard:

Attached is a letter report to Spokane County from HDR Engineers, which evaluates the content of the referenced EPA report and summarizes our conclusions as to the adequacy of Spokane County's Technology Selection Protocol.

The "*Foundational Concepts for the Spokane River TMDL Managed Implementation Plan, June 30, 2006*" stipulates that NPDES permit holders will prepare and submit to Ecology for approval, a comprehensive technology selection protocol for choosing the most effective feasible technology for seasonally removing phosphorus from their effluent with an objective of achieving a discharge with a seasonal average 50 ug/L phosphorus or lower.

Spokane County submitted its initial facilities plan document related to Technology Selection Protocol in 2002, and recognizing the importance of dissolved oxygen and phosphorus to the Spokane River, the plan recommended a membrane bioreactor system as the most effective feasible technology available to meet the anticipated stringent limits in the impending DO TMDL.

In August 2004, Spokane County participated in the Advanced Wastewater Treatment Technology Evaluation Workshop, the purpose of which was to identify and consider the applicability of all proven and emerging technologies related to achieving very low effluent phosphorus concentrations.

In November 2005, Spokane County co-sponsored the development of a study and report titled "Evaluation of Exemplary WWTP's Practicing High Removal of Phosphorus". The purpose of that report was to collect effluent data and treatment process information on a large number of facilities that are achieving very low effluent phosphorus concentrations, and to consider the applicability of the treatment process to the situation on the Spokane River.

In August 2006, Spokane County facilitated a regional treatment process workshop to review treatment systems achieving very low effluent phosphorus concentrations, as well

as available pilot project data from the City of Spokane, City of Coeur D'Alene, and from Inland Empire Paper Company.

Finally, in December 2006, Spokane County submitted its draft 2006 Wastewater Facilities Plan Amendment to Ecology for review and approval. Chapter 6 of the Amendment provides a description of the Technology Selection Protocol for the proposed Spokane County Regional Water Reclamation Facility. After 5 years of exhaustive and very expensive studies, the Amendment recommends a membrane bioreactor with biological nutrient removal (BNR) and chemical polishing. We are confident that this recommendation meets the State of Washington requirements for AKART, as well as meeting the requirements of the Foundational Concepts for the TMDL.

As you can see, the attached letter report from HDR regarding the EPA report concludes that Spokane County's Technology Selection Protocol meets all regulatory requirements, as well as meeting all of the Foundational Concepts requirements. Our recommended treatment technology is appropriate for the proposed plant. There is no new information presented in the EPA report that would affect the County's planning process or its Technology Selection Protocol for meeting the Spokane River DO TMDL.

As you know, we recently submitted revised documents related to the Delta Elimination Plan in Chapter 11 of our Amendment. We trust that these documents have satisfied all of the concerns identified by Ecology staff. We will be submitting a fully revised Final Draft 2006 Facilities Plan Amendment document soon for your final review and approval.

If you have any questions or concerns regarding this letter, please call me at 477-7289.

Sincerely,



N. Bruce Rawls, P.E.
Spokane County Utilities Director

CC: Dave Moss, Spokane County Water Reclamation Manager
Dave Clark, HDR Engineers
Lori Terry, Foster Pepper

July 13, 2007

Mr. Bruce Rawls
Utilities Division Director
Spokane County Public Works
1026 W. Broadway Avenue
Spokane, WA 99260-0430

Subject: Wastewater Treatment Facilities Plan Amendment – EPA Region 10 Report regarding
“Advanced Wastewater Treatment to Achieve Low Concentration Phosphorus”

Dear Bruce:

EPA has published a report which summarizes the performance of 23 wastewater facilities applying advanced treatment technologies to produce low effluent phosphorus:

USEPA Region 10, “Advanced Wastewater Treatment to Achieve Low Concentration of Phosphorus,” EPA 910-R-07-002, April 2007

This report has been reviewed with respect to the Technology Selection Protocol in Chapter 6 of the Wastewater Facilities Plan Amendment. The majority of the facilities included in the EPA report were considered in the Spokane County Wastewater Facilities Planning process and nothing in the report provides any basis upon which to alter the analysis that is contained in the Chapter 6 of Spokane County’s Facilities Plan Amendment.

Overview of EPA Region 10 Report

Table 1 summarizes the treatment facilities included in the EPA Region 10 report. A number of treatment technologies are included in the report, including a variety of effluent filters and treatment process train configurations. Effluent phosphorus is reported to range from as low as <0.005 mg/l to 0.12 mg/l in the facilities included in the report.

Of the 23 facilities included in the EPA report, 14 were considered in Spokane County Wastewater Facilities Planning process, either as part of the collaborative TMDL process to evaluate treatment technologies, in the November 2005 report titled “Evaluation of Exemplary WWTPs Practicing High Removal of Phosphorus,” or in the August 16, 2006 Treatment Process Workshop. Table 1 includes color highlighting of the facilities included in Spokane County Wastewater Facilities Planning.

Of the 9 facilities included in the EPA report that were not included in the Spokane County Wastewater Facilities Planning process, one does not practice phosphorus removal (Lacey Olympia Tumwater Thurston County, LOTT). The remaining 8 facilities reported average effluent phosphorus of 0.04 mg/l to 0.07 mg/l.

The abstract and introduction to the EPA Region 10 report presents a summary of tertiary filtration with aluminum and iron coagulant addition. In some cases, the assertions made in the abstract must be read carefully to avoid misinterpretation of the actual performance data presented in the report itself. For example, the abstract states that "*The total phosphorus concentration achieved by some of these WWTPs are consistently near or below 0.01 mg/l.*" However, of the 23 plants included in the report, only Breckenridge, CO (Farmers Korner), Stamford, NY, and Walton, NY actually report average phosphorus less than 0.01 mg/l. These are relatively small plants with rated capacities of 3 mgd, 0.5 mgd and 1.55 mgd, respectively -- far smaller plants than the 8 mgd capacity of the Spokane County Regional Water Reclamation Facility (SCRWRF). Further, these smaller plants do not have anaerobic digestion facilities for solids stabilization, which may impact liquid stream performance in larger facilities, such as the SCRWRF. Smaller plants that do not include anaerobic digestion and solids recycle loadings may have an advantage in terms of the ability to achieve lower effluent phosphorus.

Technology Selection Protocol

The Spokane County technology selection protocol is documented in the Wastewater Facilities Plan Amendment and includes consideration of "all known, available, and reasonable methods of prevention, control, and treatment" (AKART) and an extensive evaluation of treatment technologies for low effluent phosphorus. Initial facilities planning efforts reviewed a total of 18 candidate treatment technologies, systematically narrowed to six, and recommended two alternatives for final consideration. In the *2002 Wastewater Facilities Plan* and the *2003 Wastewater Facilities Plan Amendment* Spokane County selected a membrane bioreactor process with nitrification and denitrification (N/DN) and chemical addition for phosphorus removal as best able to protect water quality in the Spokane River. However, the new phosphorus requirements of the Washington Department of Ecology's 2004 Dissolved Oxygen Total Maximum Daily Load (TMDL) increase the demand on phosphorus removal such that multiple treatment steps are required to ensure reliable treatment performance.

For domestic wastewater, AKART is considered to be secondary treatment, as presented in Chapter 173-221 WAC. However, if secondary treatment is not sufficient to meet water quality standards, additional treatment may be required. Since Ecology's TMDL phosphorus concentration target of 10 µg/L is so low, Spokane County undertook further analysis of treatment processes for achieving low effluent phosphorus in facilities planning. This analysis has included a survey of exemplary treatment plants producing very low effluent phosphorus, review of full-scale operating facilities and site visits, treatment equipment vendor presentations, and review of the results from pilot testing. Based on this evaluation, an advanced treatment process incorporating a membrane bioreactor with biological nutrient removal (BNR) and chemical polishing is recommended as the proposed facility design for the new Spokane County Regional Water Reclamation Facility. The analysis of technologies included in *2006 Wastewater Facilities Plan Amendment* meets the requirements of AKART, and additionally meets the more stringent requirements of the Foundational Concepts for the Spokane River TMDL Managed Implementation Plan.

Discussion of EPA Region 10 Report

Many of the treatment facilities presented in the EPA Region 10 report are those that have been discussed in the collaborative TMDL working group meetings in the past and in the August 16, 2006 Treatment Process Workshop. Several of the key plants selected for the November 21, 2005 "Evaluation of Exemplary WWTPs Practicing High Removal of Phosphorus" are included in the EPA Region 10 report, including;

- Alexandria, Virginia
- Rock Creek (Portland area), Oregon
- Durham (Portland area), Oregon
- Walton, New York
- Iowa Hill (Breckenridge), Colorado
- Pinery, Colorado
- Stamford, New York

Table 2 presents a summary of the performance from the November 21, 2005 report "Evaluation of Exemplary WWTPs Practicing High Removal of Phosphorus." The Las Vegas, NV, Cauley Creek, GA, and Lone Tree (Arapahoe County), CO plants evaluated in the Spokane County Wastewater Facilities Planning were not included in the EPA Region 10 report. Table 3 presents a comparison of the effluent phosphorus performance from the EPA Region 10 report and the November 21, 2005 Exemplary Plants report. Generally, the reported effluent phosphorus values are similar between the two reports.

Low Effluent Phosphorus Performance, Plant Size and Solids Processing

Many of the plants reporting the lowest effluent phosphorus performance are small facilities (less than 5 mgd). Many do not have anaerobic digestion and solids dewatering recycle loadings impacting liquid stream treatment performance. This is a great advantage in terms of reduced loadings on the liquid stream and effluent phosphorus concentration.

Table 4 summarizes the performance of facilities included in both the November 21, 2005 Exemplary Plants report and the EPA Region 10 report in terms of plant size (larger and smaller than 5 mgd) and by solids processing method. Larger wastewater facilities generally employ anaerobic digestion to efficiently stabilize solids removed in the treatment process, reduce the quantity of solids produced, and recover energy from digester gas production. Thickening and dewatering recycled loadings from solids processing must be addressed and while their impact can be reduced in the design of the treatment process, recycle loadings remain a significant challenge to accommodate in the liquid stream process. Significantly, liquid stream performance cannot be enhanced at the expense of the solids stream in larger plants with complete solids processing through thickening, anaerobic digestion, and dewatering.

Advanced Wastewater Treatment Process Workshop

Discussions held during the collaborative Spokane River Dissolved Oxygen TMDL process and in the August 16, 2006 advanced wastewater treatment process workshop addressed technology

development, readiness, pilot testing, technology issues, and other development requirements for applicability to Spokane River dischargers. These discussions included the key treatment technologies utilized in the facilities reviewed for the EPA Region 10 report. The applicability of treatment technologies utilized in other locations and the sensitivity to local wastewater characteristics and water chemistry conditions were identified as important in process evaluations. For these reasons, local pilot treatment studies have been conducted at Inland Empire Paper, the City of Spokane, and the City of Coeur d'Alene. Many of the advanced treatment technologies included in the EPA Region 10 report were tested in these local studies, including:

- Zenon Membrane Filtration
- US Filter Trident
- Blue Water Technology Dual Sand Filtration
- Parkson Dual Sand Filtration

Tables 5 and 6 present summaries from pilot testing at the City of Spokane Riverside Park Water Reclamation Facility. Log normal effluent total phosphorus from Zenon Membrane Filtration, US Filter Trident, and Parkson Dual Sand Filtration were in the range of 0.016 to 0.018 mg/l range. Table 7 presents effluent total phosphorus results from pilot testing in Coeur d'Alene. Effluent total phosphorus from Zenon Membrane Filtration, US Filter Trident, Blue Water Technology Dual Sand Filtration, and Parkson Dual Sand Filtration were in the range of 0.019 to 0.040 mg/l range.

None of the treatment technologies included in pilot testing produced effluent total phosphorus of 0.010 mg/l or less. Further, the variability of pilot testing results exhibits the sensitivity to local applications, wastewater characteristics, water quality conditions, and site specific operations when pursuing extremely low effluent phosphorus. It is important to note that pilot testing is highly controlled and represents the best possible conditions under which treatment technologies might perform. Full-scale operations would not be expected to perform as well as pilot testing since full-scale plants cannot be operated under such tightly controlled conditions and must accept the recycle loadings from solids processing facilities.

Summary

The majority of the facilities included in the EPA Region 10 report were considered in the Spokane County Wastewater Facilities Planning process. The Spokane County technology selection protocol is documented in the 2006 Wastewater Facilities Plan Amendment and includes consideration of "all known, available, and reasonable methods of prevention, control, and treatment" (AKART) and an extensive evaluation of treatment technologies for low effluent phosphorus. This analysis has included a survey of exemplary treatment plants producing very low effluent phosphorus, review of full-scale operating facilities and site visits, treatment equipment vendor presentations, and review of the results from pilot testing. Based on this evaluation, an advanced treatment process incorporating a membrane bioreactor with biological nutrient removal (BNR) and chemical polishing is recommended as the best technology for the Spokane County Regional Water Reclamation Facility. The analysis of technologies included

Mr. Bruce Rawls
July 13, 2007

in 2006 *Wastewater Facilities Plan Amendment* meets the requirements of AKART, and additionally meets the more stringent requirements of the Foundational Concepts for the Spokane River TMDL Managed Implementation Plan.

Please call if you have any questions.

Sincerely,
HDR ENGINEERING, INC.



David L. Clark, P.E.
Project Manager

Cc: David Keil, HDR Engineering, Inc
Mario Benisch, HDR Engineering, Inc.
David Moss, Spokane County
Dr. JB Neethling, HDR Engineering, Inc.
File 000000000043026

Mr. Bruce Rawls
July 13, 2007

Table 1. Summary of EPA Region 10 Report on Low Concentration Effluent Phosphorus¹ With Color Highlighting Designating Inclusion in Spokane County Facilities Planning^{2,3,4,5}

Facility Name and Location	Capacity (mgd)	Advanced Phosphorus Treatment Technology	NPDES Permit Limitation for Phosphorus	Average Effluent P (mg/l)	Range of Monthly Average P (mg/l)
Sand Creek WWRP, Aurora, CO ^{3,5}	5	BNR, Filtration	None	0.1 – 0.20	N/A
Breckenridge, CO Iowa Hill WWRP ^{2,3,5}	1.5	BNR, Chemical addition, tertiary settlers and filtration	0.5 Daily max annual 225 lbs/yr	0.55	0.17 – 0.13
Breckenridge, CO Farmers Korner WWTP ^{3,5}	3	BNR, Chemical addition, tertiary settlers and filtration	0.5 Daily max annual 225 lbs/yr	0.007	0.002 – 0.036
Summit County, CO Snake River WWTP ³	2.6	BNR, Chemical addition, tertiary settlers and filtration	0.5 Daily max annual 340 lbs/yr	0.015	<0.01 – 0.04
Parker, CO Pinery WWRF ^{2,3}	2	BNR, Chemical addition, two-stage filtration	0.50, 304 lbs/yr	0.29	0.021 – 0.074
Clean Water Services, Rock Creek WWTP, OR ^{2,5}	39	Chemical addition, filtration	0.1 Month median	0.07	0.04 – 0.09
Clean Water Services, Durham WWTP, OR ^{2,5}	24	BNR, Chemical addition, filtration	0.110 Month median	0.07	0.05 – 0.10
Stamford, New York ^{2,5}	0.5	Chemical addition, two-stage filtration	0.2	<0.011	<0.005 – <0.06
Walton, New York ^{2,5}	1.55	Chemical addition, two-stage filtration	0.2	<0.01	<0.005 – <0.06
Milford WWTP, Milford, MA	4.8	Multi-point chemical addition, filtration	0.2	0.07	0.04 – 0.16
Alexandria AWWTP, Alexandria, VA ^{2,4,5}	54	BNR, Multi-point chemical addition, tertiary settling and filtration	0.18	0.065	0.04 – 0.10
Upper Occoquan Sewerage Authority WWTP, VA ⁵	54	Chemical (high lime) and tertiary filtration	0.10	<0.088	0.023 – <0.282
Fairfax County, Noman Cole WWTP, VA ⁵	67	BNR, Chemical addition, tertiary clarification and filtration	0.18	<0.061	<0.02 to <0.13
BluePro Treatment Pilot,	NA	Iron coated sand in two-	NA	0.013	NA

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Facility Name and Location	Capacity (mgd)	Advanced Phosphorus Treatment Technology	NPDES Permit Limitation for Phosphorus	Average Effluent P (mg/l)	Range of Monthly Average P (mg/l)
Hayden, ID ⁵		stage filters			
CoMag Treatment Pilot, Concord WWTP ^{4, 5}	NA	Chemical addition, ballasted sedimentation, magnetite polishing	NA	0.04	NA
Delhi, NY	0.82	Activated sludge, Chemical addition, filtration	0.11	0.04	<0.02- 0.085
Pine Hill WWTP, NY	0.5	RBC, sand filters, chemical addition, microfiltration	0.2	0.06	0 – 0.12
NYC DEP Grand Gorge STP, NY	0.5	RBC, sand filters, chemical addition, microfiltration	0.2	<0.04	0 to 0.05
Hobart PCF, NY	0.18	Activated sludge, sand filters, chemical addition, microfiltration	0.5	<0.05	<0.026 – 0.07
Snyderville Basin Water Reclamation District, UT	4	BNR, chemical addition, filtration	0.1	0.04	0.03 – 0.06
Ashland WWTP, OR	2.3	Oxidation ditch, chemical addition, membrane filtration	1.6 lb/d (0.083 mg/l)	0.07	0.05 – 0.12
McMinneville WWTP, OR	5.6	Oxidation ditch (BNR), Chemical addition, multi-media traveling bed filtration	0.07	0.058	0.036 – 0.092
LOTT WWTP, Olympia, WA	28	BNR <i>(No effluent phosphorus limits)</i>	TIN 3.0	TIN 2.2	TIN 1.23 – 2.81

¹ USEPA Region 10, "Advanced Wastewater Treatment to Achieve Low Concentration of Phosphorus," EPA 910-R-07-002, April 2007

² Yellow shading indicates a facility analyzed in the November 21, 2005 "Evaluation of Exemplary WWTPs Practicing High Removal of Phosphorus" and analytical results presented in August 16, 2006 Treatment Process Workshop.

³ Green shading indicates presentation of facility analysis by Larry Esvelt, Esvelt Environmental Engineering, at the August 16, 2006 Treatment Process Workshop (Sand Creek, Iowa Hill, Farmers Korner, Snake River, Pinery).

⁴ Orange shading indicates presentation of facility analysis by Mark Laquidara, Metcalf and Eddy, at the August 16, 2006 Treatment Process Workshop (Alexandria, Blue Plains, Syracuse, and CoMag Technology summary).

⁵ Blue shading indicates inclusion in a summary presentation by Brian Nickel of USEPA Region 10 at the August 16, 2006 Treatment Process Workshop.

Mr. Bruce Rawls
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Table 2. Summary of Exemplary WWTPs in U.S. Practicing High Phosphorus Removal¹

Facility	Average Design Flow (mgd)	Recent Average Flow (mgd)	NPDES Total Phosphorus Limit (µg/L)	Final Effluent Log Normal Average Total Phosphorus (µg/L)	
				Year 1	Year 2
Las Vegas, Nevada	91	63	170	179	152
Alexandria, Virginia	54	40	Month 180, week 270	134	88
Rock Creek (Portland area), Oregon	34	32	Month median 100 May 1 through October 31	82	71
Durham (Portland area), Oregon	25	17	Month median 110 May 1 through October 31	102	73
Cauley Creek (Atlanta area), Georgia	5.0	4.1	130	123	86
Lone Tree (Arapahoe County) Colorado	2.4	1.6	Daily 50	40	30
Walton, New York	1.6	1.1	150		8 ²
Iowa Hill (Breckenridge), Colorado	1.5	0.8	Daily 50, annual 225 lbs	9	8
Pinery, Colorado	1.0	0.6	Month 50, daily 100, annual 150 lbs	29	31
Stamford, New York	0.5	0.4	200		20

¹ November 21, 2005 "Evaluation of Exemplary WWTPs Practicing High Removal of Phosphorus". Year 1 data is generally 2004 and Year 2 is generally a portion of the year 2005.

² Corrected data set from certified laboratory analytical results presented in August 16, 2006 Treatment Process Workshop supersedes earlier data analysis presented in the November 21, 2005 technical memorandum

Mr. Bruce Rawls
July 13, 2007

Table 3. Comparison of Reported Effluent Results from EPA Region 10 Report¹ and Summary of Exemplary WWTPs in U.S. Practicing High Phosphorus Removal²

Facility	Average Design Flow (mgd)	Exemplary Plants Final Effluent Log Normal Average Total Phosphorus ² (µg/L)		USEPA Region 10 Advanced Wastewater Treatment Plant Report ¹	
		Year 1	Year 2	Average Effluent P (µg/L)	Range of Monthly Average P (µg/L)
Las Vegas, Nevada	91	179	152	NA ³	NA
Alexandria, Virginia	54	134	88	65	40 - 100
Rock Creek (Portland area), Oregon	34	82	71	70	40 - 90
Durham (Portland area), Oregon	25	102	73	70	50 100
Cauley Creek (Atlanta area), Georgia	5.0	123	86	NA	NA
Lone Tree (Arapahoe County) Colorado	2.4	40	30	NA	NA
Walton, New York	1.6		8	<10	<5 - <6
Iowa Hill (Breckenridge), Colorado	1.5	9	8	55	17 to 130
Pinery, Colorado	1.0	29	31	29	21 - 74
Stamford, New York	0.5		20	<11	<5 - <6

¹ USEPA Region 10, "Advanced Wastewater Treatment to Achieve Low Concentration of Phosphorus," EPA 910-R-07-002, April 2007

² November 21, 2005 "Evaluation of Exemplary WWTPs Practicing High Removal of Phosphorus". Year 1 data is generally 2004 and Year 2 is generally a portion of the year 2005.

³ Not Applicable. Not include in EPA Region 10 Report.

Table 4. Facility Size and Solids Processing in Comparison with Effluent Phosphorus

Facility	Ave. Design Flow (mgd)	Exemplary Plants Final Effluent Log Normal Average Total Phosphorus ² (µg/L)		USEPA Region 10 Advanced Wastewater Treatment Plant ¹		Solids Processing Comments
		Year 1	Year 2	Average Effluent P (µg/L)	Range of Monthly Average P (µg/L)	
Larger facilities with design flows greater than 5 mgd with anaerobic digestion and dewatering (Effluent phosphorus ranging from 40 to 179 ug/l)						
Las Vegas Nevada	91	179	152	NA ³	NA	Anaerobic Digestion, Dewatering
Alexandria, Virginia	54	134	88	65	40 - 100	Anaerobic Digestion, Dewatering
Rock Creek (Portland area), Oregon	34	82	71	70	40 - 90	Anaerobic Digestion, Dewatering
Durham (Portland area), Oregon	25	102	73	70	50 - 100	Anaerobic Digestion, Dewatering
Smaller facilities with design flows of 5 mgd or less, with aerobic digestion or no solids handling (Effluent phosphorus ranging from 5 to 130 ug/l)						
Cauley Creek (Atlanta area), Georgia	5.0	123	86	NA	NA	Aerobic Digestion, Dewatering
Lone Tree (Arapahoe County) Colorado	2.4	40	30	NA	NA	Aerobic Digestion, Dewatering
Walton, New York	1.6		8	<10	<5 - <6	Aerobic Digestion, Dewatering
Iowa Hill (Breckenridge) Colorado	1.5	9	8	55	17 to 130	None
Pinery, Colorado	1.0	29	31	29	21 - 74	Holding Basins, Dewatering
Stamford, New York	0.5		20	<11	<5 - <6	Aerobic Digestion, Dewatering

¹ USEPA Region 10, "Advanced Wastewater Treatment to Achieve Low Concentration of Phosphorus," EPA 910-R-07-002, April 2007

² November 21, 2005 "Evaluation of Exemplary WWTPs Practicing High Removal of Phosphorus". Year 1 data is generally 2004 and Year 2 is generally a portion of the year 2005.

³ Not Applicable. Not include in EPA Region 10 Report.

Mr. Bruce Rawls
July 13, 2007

**Table 5. Summary of City of Spokane Riverside Park Water Reclamation Facility
Phosphorus Removal Pilot Testing¹**

TABLE 2
Summary of Fall 2005 RPWRF Phosphorus Removal Technology Pilot Testing

Technology	Final Effluent Log Normal Average Total Phosphorus (µg/L)	Coefficient of Variation of Final Effluent Total Phosphorus (µg/L)
US Filter MicroflocTrident	18	0.47
Parkson DynaSand D2 Filtration	16	0.35
Zenon Membrane Filtration	16	0.46

¹ November 21, 2005 "Evaluation of Exemplary WWTPs Practicing High Removal of Phosphorus"

Table 6. Summary of City of Spokane Riverside Park Water Reclamation Facility Phosphorus Removal Pilot Testing¹

Table 1. Summary of Statistical Evaluation of Pilot Plant Test Results.

Pilot Unit	Dates	Test	Lab	Influent to Pilot Plant			Pilot Plant Effluent		
				50%	95%	99%	50%	95%	99%
Parkson Dynasand D2	9/6-10/11/05	TP	Anatek	0.53	1.55	2.42	0.020	0.050	0.073
			RPWRF	0.56	1.53	2.33	0.014	0.023	0.029
		SP	Anatek	0.073	0.24	0.39	0.016	0.050	0.080
			RPWRF	0.089	0.117	0.146	0.011	0.017	0.021
Zenon ZeeWeed 500	9/26-10/21/05	TP	Anatek	0.47	3.00	6.47	0.018	0.040	0.054
			RPWRF	0.90	1.64	2.04	0.016	0.041	0.061
		SP	Anatek	0.056	0.157	0.241	0.017	0.048	0.074
			RPWRF	0.083	0.139	0.192	0.014	0.031	0.043
US Filter Trident	9/7-10/7/05	TP	Anatek	0.50	1.30	1.93	0.015	0.029	0.038
			RPWRF	0.54	1.48	2.25	0.015	0.026	0.033
		SP	Anatek	0.075	0.167	0.234	0.013	0.025	0.033
			RPWRF	0.067	0.145	0.200	0.0124	0.020	0.024
US Filter Trident HS	10/20-11/1/05	TP	Anatek	0.59	3.07	6.08	0.016	0.028	0.036
			RPWRF	1.21	1.77	2.07	0.014	0.025	0.032
		SP	Anatek	0.15	0.85	1.76	0.011	0.020	0.025
			RPWRF	0.20	0.27	1.89	0.012	0.021	0.027
Kruger Actiflo	1/5-1/12/05	TP	RPWRF	1.45	4.57	7.31	0.013	0.077	0.165
A& Pilot Plant Results	2005	TP	Anatek	0.54	1.72	2.79	0.018	0.039	0.053
			RPWRF	0.72	1.92	2.76	0.0135	0.027	0.036

Notes: TP = Total Phosphorus; SP = Soluble Phosphorus (total phosphorus not removed by 0.4 micron filter).
 Lab: Anatek = Anatek Laboratory; RPWRF = Riverside Park Water Reclamation Facility Laboratory.
 Pilot Plant Influent and Effluent: Influent = RPWRF final effluent before chlorination; Effluent = Pilot Plant Final Effluent.
 Statistical Results: 50% = EXP of Average of natural log normalized data.
 95% = EXP of Average + 1.6449 times Standard Deviation of natural log normalized data.
 99% = EXP of Average + 2.3263 times Standard Deviation of natural log normalized data.

¹ Presented by Larry Esvelt, Esvelt Environmental Engineering, at the August 16, 2006 Treatment Process Workshop.

Mr. Bruce Rawls
July 13, 2007

Table 7. Summary of City of Coeur d'Alene Phosphorus Removal Pilot Testing¹

Technology	Final Effluent Total Phosphorus – All Data Reported (µg/L)²	Final Effluent Total Phosphorus – Excluding Data Excursions Due to Equipment (µg/L)³
Zenon ZW-500 Membrane Filtration	67.4	24.1
US Filter Trident THS-1	19.2	19.2
BlueWater Technology BluePro Dual Sand Filtration	21.4	21.4
Parkson D2 Dual Sand Filtration	84.1	39.6

¹ Preliminary Coeur d'Alene pilot study results were presented by Mario Benisch, HDR Engineering, at the August 16, 2006 Treatment Process Workshop.

² Effluent phosphorus performance data (all data) from Table 3 of the City of Coeur d'Alene "Tertiary Phosphorus Removal Technology Pilot Study," Final Draft Report, May 2007.

³ Effluent phosphorus performance data (excluding equipment caused excursions) from Table 4 of the City of Coeur d'Alene "Tertiary Phosphorus Removal Technology Pilot Study," Final Draft Report, May 2007.

S P O K A N E C O U N T Y



UTILITIES DIVISION
N. Bruce Rawls, P.E., Utilities Director

A DIVISION OF THE PUBLIC WORKS DEPARTMENT

July 2, 2007

Ms. Drea Traeumer
Water Quality Section
State of Washington Department of Ecology
4601 North Monroe Street
Spokane, WA 99205-1295

Subject: Spokane County December 2006 DRAFT Wastewater Facilities Plan Amendment
Response to Ecology Comments Dated March 20, 2007

Dear Ms. Traeumer:

Thank you for your letter dated March 20, 2007, containing Ecology's comments to Spokane County's Draft Wastewater Facilities Plan Amendment Chapter 11 (Phosphorus Management Plan) and Appendix B (Onsite Sewage Disposal System Phosphorus Loading Estimate). As a result of your review comments, Spokane County and our consultant HDR Engineering, Inc. have made substantial revisions to the analysis in Appendix B, and have added substantial information to Chapter 11. Along with this letter, are revised drafts of Appendix B and Chapter 11. We are incorporating these drafts into a revised Final Draft 2006 Wastewater Facilities Plan Amendment, which will be submitted to Ecology very soon. This revised document also addresses all of the review comments provided by Richard Koch.

This letter responds to each of Ecology's comments and, for ease of reference, our response follows the same format of Ecology's comment letter.

The significance of offsets and requirements of WAC 173-201A-450 and how the Phosphorus Management Plan meets these requirements is not apparent in Chapter 11. The need for offsets appears critical to the County's decision to focus on the Septic Tank Elimination Program offset opportunities; however, that strategy is not self evident. Please make the strategy self evident, particularly by including more detailed discussion of the significance and requirements of WAC 173-201A-450 and how each water quality offset requirement is met by the Phosphorus Management Plan.

WAC 173-201A-450 states that water quality offsets may be allowed by the department when all of the following conditions are met:

Located at: 1026 W. Broadway, 4th Floor
1026 W. Broadway • Spokane, WA 99260-0430
(509) 477-3604 • FAX: (509) 477-4715 • TDD: (509) 477-7133

(a) Water quality offsets must target specific water quality parameters.

The water quality offsets described in the Phosphorus Management Plan target a specific water quality parameter – Total Phosphorus.

(b) The improvements in water quality associated with creating water quality offsets for any proposed new or expanded actions must be demonstrated to have occurred in advance of the proposed action.

The improvements in water quality associated with creating water quality offsets for septic tank elimination from 2001 to 2011 will occur in advance of the discharge from the Spokane County Regional Water Reclamation Facility (SCRWRF) and exceed the requirements to meet the offset required under the Foundational Concepts and the TMDL. Additional improvements in water quality associated with septic tank elimination will occur as additional septic systems are eliminated after the discharge from the SCRWRF begins in 2011.

(c) The technical basis and methodology for the water quality offsets is documented through a technical analysis of pollutant loading, and that analysis is made available for review by the department. The methodology must incorporate the uncertainties associated with any proposed point or nonpoint source controls as well as variability in effluent quality for sources, and must demonstrate that an appropriate margin of safety is included. The approach must clearly account for the attenuation of the benefits of pollution controls as the water moves to the location where the offset is needed.

A technical basis and methodology for the water quality offsets has been documented through a technical analysis of pollutant loading and this analysis has been made available to Ecology. Ecology has provided comment on this technical analysis in meetings and through the comment letter dated March 20, 2007. An updated technical analysis has been prepared to include identification and discussion of the uncertainties associated with the estimated phosphorus load reduction to Long Lake from septic tank elimination. As discussed in the updated analysis and in the meetings with WDOE, an appropriate margin of safety has been incorporated in the offset evaluation. Furthermore, the analysis accounts for the attenuation of the load reduction from septic system elimination as water moves to Long Lake via the Spokane Valley Aquifer and the Spokane River.

(d) Point or nonpoint source pollution controls must be secured using binding legal instruments between any involved parties for the life of the project that is being offset. The

proponent remains solely responsible for ensuring the success of offsetting activities for both compliance and enforcement purposes.

Spokane County is committed to nonpoint source reduction of phosphorus through its Septic Tank Elimination Program (STEP). This program addresses concerns expressed by the State of Washington Board of Health and is described in the 2001 Comprehensive Wastewater Management Plan (CWMP). The 2001 CWMP serves as the County's Sewerage General Plan under the County Services Act, Chapter 36.94 RCW. It also serves as the County's General Sewer Plan, as specified by WAC 173-240. A Centennial Clean Water Fund grant from Ecology for \$3,750,000 per year through the year 2014 is dedicated to the completion of the STEP. The use of this grant for the financing of STEP sewers is detailed in the 2001 CWMP and the remaining projects included in the STEP are prioritized. Project priorities were assigned based on a variety of criteria, ranging from aquifer susceptibility to density of development and history of drainfield failures. Spokane County has been implementing the STEP and is on target to complete the STEP by the end of 2015. This plan has been adopted by the Spokane County Board of County Commissioners and is the binding legal instrument that commits Spokane County to the STEP.

(e) Only the proportion of the pollution controls which occurs beyond existing requirements for those sources can be included in the offset allowance.

Phosphorus loading reduction is not a requirement of the STEP program or any other existing requirement. Therefore, all of the reduction in phosphorus loadings due to the STEP program occurs beyond existing requirements. To increase the margin of safety in the estimate of phosphorus load reduction, Spokane County is only accounting for the water quality offset from the reduction of septic systems constructed after the TMDL baseline year of 2001.

(f) Water quality offsets must meet antidegradation requirements in WAC 173-201A-300 through 173-201A-330 and federal antibacksliding requirements in CFR 122.44(l).

The water quality offset described in Chapter 11 of the Draft 2006 Wastewater Facilities Plan Amendment meets the antidegradation requirements of WAC 173-201A-300 through 173-201A-330, as approved by EPA on May 2, 2007. The offsets will not result in lowering of water quality from its current condition and, instead, will provide water quality treatment where it would otherwise not exist. Moreover, Spokane County's treatment facility will treat the septic tank effluent to a higher standard than it would otherwise receive if routed to the City's existing sewage treatment plant. With regard to Tier 1, existing and designated uses will be maintained. The Foundational Concepts document authorizes offsets as part of the

TMDL in order to implement the DO TMDL. The offsets proposed by the County are consistent with the Foundational Concepts document. Tier II is not implicated here because the water quality in the River is not of a higher quality than the dissolved oxygen criterion. Tier II is not implicated because the Spokane River has not been designated as an "outstanding resource water."

The offsets are also consistent with federal anti-backsliding requirements contained in 40 CFR 122.44 (I). There is no backsliding prohibition that pertains directly to offsets in the federal Clean Water Act or federal water quality regulations. The anti-backsliding provisions governing NPDES permits are contained in 33 USC § 1342(o). The general prohibition against anti-backsliding is contained in 33 USC §1342(o)(1). The second part of that provision applies to water quality based effluent standards, which is the applicable standard for purposes of issuing NPDES permits in accordance with TMDLs. In states, in part, as follows: "In the case of an effluent limitation established on the basis of section 1311(b)(1)(C) of this title . . . a permit may not be renewed, reissued, or modified to contain effluent limitations which are less stringent than the comparable effluent limitations in the previous permit." The prohibition against backsliding does not apply here because the County has never had an NPDES permit that contained effluent limits for a direct discharge from the County's sewage treatment facility to the Spokane River. Therefore, the offsets proposed by the County are consistent with the federal anti-backsliding requirements.

Chapter 11 does not provide much detail on Reuse. While Ecology is aware that a further effort is planned in the near future, some discussion in terms of possible "what if" scenarios is appropriate.

The Spokane County Reclaimed Water Use Study is currently being developed to supplement the effluent end use discussion contained in the approved Spokane County Wastewater Facilities Plan and the draft 2006 Wastewater Facilities Plan Amendment. The "what if" scenarios for water quality offset will be based on removing flow from the river discharge at an effluent phosphorus concentration of 50 µg/L. However, the potential reduction in phosphorus loading to the Spokane River from reuse is not needed to comply with the Foundational Concepts and TMDL because the treatment technology proposed, together with the offsets from the Septic Tank Elimination Program will comply with the Foundational Concepts and the TMDL.

A Wastewater Treatment Plant does not operate at the design effluent limitations immediately upon start up; therefore, please include a margin of safety to account for this.

The following language in the Foundational Concepts document (page 9, "New Spokane County Treatment Plant," provides for the initial operation of the Spokane County Regional Water Reclamation Facility:

"The County will construct the plant within the first 6 years of the MIP as the County's offsets from the target pursuit actions are being developed and made operative. It is recognized that any phosphorous reduction actions selected by the County that rely on the plant achieving normal, routine operation for their full implementation (such as completing septic tank hookups and/or water re-use) can still contribute to the County's offsets. It is further recognized that, because modern phosphorus removal technology is challenging, achieving normal, and routine operation may require two years, assuming average seasonal conditions (temperature and flow) during both years. During this period, Ecology will recognize these conditions and their effects on compliance with interim discharge limits."

Comment 4: Please add background information that describes the Spokane Valley-Rathdrum Prairie aquifer, including its characteristics (i.e. kinetics and transmissivity) and its interaction with the Spokane River.

Background information that describes the Spokane Valley-Rathdrum Prairie aquifer, including its interaction with the Spokane River, has been added to the revised phosphorus loading analysis, which replaces the Draft Onsite Sewage Disposal Systems Phosphorus Loading Estimate in Appendix B of the Draft 2006 Wastewater Facilities Plan Amendment.

Comment 5: Please discuss the available methods to predict time to breakthrough and why the selected methods were chosen.

Further discussion of available methods to predict time to breakthrough, as well as a discussion that explains how and why the selected methods were chosen, has been added to the revised phosphorus loading analysis in Appendix B of the Draft 2006 Wastewater Facilities Plan Amendment. The breakthrough analysis utilizes a simple, but widely accepted, P sorption capacity approach, where once the phosphorus sorption capacity of the soil is exceeded, breakthrough of P occurs. This approach is consistent with that used by Montana to predict breakthrough time. While more sophisticated vadose zone models exist (for example, HYDRUS-2D), these models also rely on estimating soil phosphorus sorption capacity using sorption coefficients similar, if not identical, to the approach used here. An important objective of this evaluation was to use methods that are acceptable by the scientific and regulatory community and are understandable to review. The approach used here is consistent with guidance developed by the Idaho DEQ and Montana DEQ and is consistent with recommended

modeling approaches in recent scientific literature (for example, Modeling Phosphorus in the Environment by M.L. Cabrera and D E. Radcliffe (eds.), 2006).

Comment 6: It appears to Ecology that a hybrid of Montana DEQ and Idaho DEQ was used. To help us better understand the need for what we perceive as a hybrid, please include a breakthrough analysis that adheres to Montana DEQ methods and recommendations and one that adheres to Idaho DEQ methods and recommendations. Please use this comparison to substantiate the use of the hybrid model and associated input values.

The approach used in the Spokane County analysis can be considered a "hybrid" in that information from both Montana and Idaho was used along with site specific data and the scientific literature to develop an approach that was appropriate for Spokane County. As described in the March 29, 2007 meeting with Ecology, Montana's approach is an estimate of breakthrough time (years) for new systems and does not analyze loading quantity. On the other hand, Idaho DEQ takes the position that breakthrough will eventually occur, and the focus should be on the quantity of loading. Furthermore, Idaho DEQ recommends that as an initial screening analysis, no sorption of phosphorus to soils is assumed at all. Neither Montana nor Idaho approaches fit the exact requirements of the Spokane County evaluation in terms of determining quantity of P loading with sorption and breakthrough assumptions for older, existing systems. Thus, HDR developed an approach that matched the project needs and cited both Montana and Idaho as states with regulations and guidelines that recognize the importance of P loading to groundwater and surface water. The steps used to develop estimates of P loading to groundwater and surface water are described in detail, along with supporting documentation for values chosen, in Appendix B of the Draft 2006 Wastewater Facilities Plan Amendment.

- *The use (of) a soil phosphorus adsorption capacity of 150 ppm in calculations needs justification. Verbal explanation has been given; however, Ecology needs written justification provided in the text of the Wastewater Facilities Plan and not in a reference. Ecology would appreciate this input be justified based on knowledge of the local hydrogeology of the Spokane Valley.*

Written justification for the soil phosphorus adsorption capacity(s) is included in the revised phosphorus loading analysis in Appendix B of the Draft 2006 Wastewater Facilities Plan Amendment. By way of summary, the original assumption of 150 mg/kg was a professional judgment of the average phosphorus sorption capacity of soils in the Spokane Valley based on their coarse nature and relatively low aluminum and iron content. The refined analysis uses 200 mg/kg sorption capacity in the immediate vicinity of the drainfield itself. The 200 mg/kg sorption capacity is reduced with depth in recognition of the coarse soil structure and lack of mineral content effective in sorbing phosphorus. From 3 to 13 feet of depth, a sorption capacity

of 150 mg/Kg has been assumed to represent the increase in gravel and boulders. From 13 feet of depth to groundwater, a sorption capacity of 50 mg/Kg has been assumed. Because much of the vadose zone is almost all sand or coarser material, which has little to no P sorption capacity, these estimates are conservative -- the sorption capacity is likely overestimated, providing an additional margin of safety.

- *Include the variable 'Distance from Drainfield to Surface Water' in the breakthrough analysis.*

As discussed during the March 29, 2007 meeting and presented in the updated Appendix B, the evaluation recognizes and accounts for P fate and transport in the SVRP aquifer with a large retention factor. Montana DEQ's approach for using a sorption coefficient for the saturated aquifer is not appropriate for the SVRP. This aquifer is primarily comprised of gravel, cobbles, and boulders making it one of the most transmissive aquifers in the world. Furthermore, because of its physical makeup, there are minimal iron and calcium surfaces and minerals to create sorption sites for phosphorus. Nonetheless, a large phosphorus retention factor of between 50 and 70 percent was assumed, providing a large margin of safety.

Comment 7: Please add discussion on the rationale/justification for 1) omitting the variable 'Distance from Drainfield to Surface Water' and 2) modifying the values used in the breakthrough analysis currently presented in Appendix B.

As described above, the variable 'Distance from Drainfield to Surface Water' is not applicable to the breakthrough of phosphorus in the SVRP aquifer. The values used in the breakthrough analysis were adjusted to reflect the best available information pertaining to the Spokane County service area. A justification of the variables used in the analysis is included in the revised phosphorus loading analysis for Appendix B of the Wastewater Facilities Plan Amendment.

Comment 8: Please add a summary table of breakthrough analyses performed, including inputs and results, so that the analyses may be readily compared.

A summary of input variables and results is included in the revised phosphorus loading analysis for Appendix B of the Wastewater Facilities Plan Amendment.

Comment 9: Please discuss the available methods to predict groundwater attenuation, and why the selected methods were chosen.

Methods for predicting P groundwater attenuation involve an estimate of a retardation factor where the retardation factor is equated to the groundwater velocity divided by the P velocity.

This retardation factor can be entered into a groundwater model where groundwater velocity is predicted along with estimates of groundwater discharge to surface water. Estimates of P velocity rely on either field measurements of P movement over time or, as is most often used, an estimate of a sorption (retention) coefficient, similar to what is used for soil leaching estimates. For Spokane County, the approach used was to first predict which septic systems over the aquifer and within the Spokane County service area would have P breakthrough to groundwater by 2005. Then, the quantity of P entering the groundwater system from the septic systems was determined. Given the geochemical and physical conditions of the SVRP aquifer and previous studies conducted on the aquifer, the majority of the P entering the groundwater system will likely enter Long Lake. The USGS is currently updating a groundwater model for the SVRP aquifer. This model will include the hydraulic connection between groundwater and surface water. It is recognized that the Spokane River and the Little Spokane River have reaches that are "losing" (groundwater recharge) and "gaining" (groundwater flow into the river). Not only does this occur at specific geographic locations but there are some areas where the rivers may gain or lose depending upon the time of year. It *might* be possible to integrate a fate and transport model into the new USGS model to predict P loadings to surface water, although that approach is not likely to yield additional certainty beyond the very conservative assumptions that we have used in predicting fate and transport of P to surface water. Measuring P sorption by laboratory studies is very difficult because one needs to represent the aquifer matrix, which is primarily gravels, cobbles, and boulders. Little to no sorption can be expected on these coarse materials. Furthermore, given the very high aquifer transmissivity, a fate and transport analysis would need to account for the kinetics of sorption. Because the pH of the aquifer is nearly neutral, the main sorption mechanisms would be with calcium carbonate, but such sorption would be limited given the high transmissivity of the aquifer (*kinetics effect*), very low available surface area, and low occurrence of calcium.

Given the complexity of such a modeling approach, a "soil/aquifer retention factor" was chosen to represent sorption and groundwater pumping. This approach is scientifically reasonable, valid, and provides a conservative margin of safety.

Comment 10: Ecology is inclined to request the use of an alternate method to account for phosphorus attenuation in the groundwater. Better justification of the soil/aquifer retention factor method applied in the current analysis is needed to ensure it is scientifically defensible because at the moment, Ecology has yet to be convinced it is appropriate to apply this method to the Spokane River watershed. The currently proposed soil/aquifer retention factors were developed using data from 47 north temperate lakes as part of an empirical phosphorus lake model developed by EPA (Reckhow 1980). Per EPA, "The result is a set of phosphorus export coefficients that are generally representative of the watershed conditions described." (Reckhow 1980). EPA further states, "A few limitations on the use of the model should be mentioned now.

Since the model was constructed only from lakes within the north temperate zone, it should be applied only to lakes within this zone." (Reckhow 1980). The 47 north temperate lakes used to develop the model were located in Michigan (W Reckhow, Duke University, personal communication).

Please see the discussion for Comment 9.

Comment 11: There appears to be a contradiction between Chapter 11 and Appendix B. Chapter 11 proposes that the Septic Tank Elimination Program will reduce phosphorus loading to the aquifer; however, Figures 2 and 3 in Appendix B suggest that phosphorus loading to the aquifer is increasing. Please discuss why phosphorus loading to the aquifer has increased during the on-going Septic Tank Elimination Program, what trend is expected in the future, and why the trend is expected.

The increase in P loadings to the aquifer is related to breakthrough of P from existing septic systems. There is a time lag in that it can take many years for the P breakthrough to occur to groundwater. The analysis accounts for this time. Thus, P loading can be expected to increase until septic systems are removed. Once removed, the hydraulic loading will decrease and P loading to groundwater can be expected to decrease. Furthermore, the STEP has eliminated some, but not all, septic systems over the aquifer, and STEP will only eliminate septic systems within the Spokane County sewer service area. STEP started in the mid-1980's and will be completed by 2015.

Comment 12: Please discuss why fewer well sampling data were used for the 2006 estimate of aquifer loading as compared to the 2004 estimate, and the implications of using fewer data. The annual average groundwater total phosphorus concentrations were developed using inverse distance weighted interpolation of data collected from 69 wells in 2004 and 44 wells in 2006. The interpolation results were then used to estimate the annual average aquifer loading, with 10.7 lbs/day estimated using 2004 data and 32.0 lbs/day estimated using 2006 data. However, concentration data from 25 wells were not included in the 2006 interpolation and loading estimate. A review of Figures 2 and 3 indicates that these 25 wells were those with the lowest measured concentrations in 2004 (0-5 µg/L). Are these data available? If so, please include them in the 2006 loading estimate. If the data were omitted for a reason, please provide that rationale to Ecology. If the data are not available, please see the recommendations at the end of this letter.

The phosphorus monitoring data used in the earlier phosphorus loading estimates included samples from both monitoring wells and production wells. The data from the production wells

were not gathered at regular intervals while the data from the monitoring wells were gathered at regular intervals (quarterly).

Recommendations (Department of Ecology):

- *Evaluate and discuss groundwater flow paths, timing, and gaining/losing reaches of the Spokane River to refine the scope of the breakthrough analysis to only those septic tanks that are hydrologically connected to the river within the appropriate time.*

The SVRP Aquifer is hydraulically connected to the Spokane River and Long Lake. Ecology has not defined the term "appropriate time," so Spokane County has interpreted this to mean having achieved breakthrough prior to the time that the septic system is or was removed from service.

Ecology's interpretation of "appropriate time" may be the travel time in the aquifer from a septic system to Long Lake. The Spokane Aquifer Atlas reports the velocity of the aquifer is as high as 50 feet per day (3.46 miles per year). The Idaho Department of Environmental Quality reports that the aquifer velocity at the state line is 64 feet per day (4.42 miles per year). The US Army Corps of Engineers has reported the aquifer velocity at the state line could be as high as 90 feet per day (6.22 miles per year). The USGS may report yet another velocity in the aquifer upon publication of its updated groundwater model. Many septic systems are located in close proximity to the Spokane River and if they are upgradient of gaining river segments, may contribute to surface water loadings within a year. For example, septic systems located within 3 or 4 miles of the aquifer upgradient of gaining reaches of the river could reach the river in less than a year at travel times of 3.46 to 6.22 miles per year. The distance from the farthest septic system within the Spokane County service area to Long Lake is approximately 26 miles. At 3.46 miles per year, a "drop" of water from this septic system would travel to Long Lake in 7.5 years if it traveled in the aquifer and not in the river. If the "drop" traveled in the river, the travel time would be shorter.

- *Determine local septic tank effluent quality.*

The septic tank effluent quality assumed in the Onsite Sewage Disposal System Long Lake Phosphorus Loading Study is based upon literature values for typical residential wastewater and is described (including references) in Appendix B of the Draft 2006 Wastewater Facilities Plan Amendment. The phosphorus concentration in septic tank effluent in Spokane County may currently be less than literature values and less than historical values due to the recent publicity of reducing phosphates in dishwashing detergents. The breakthrough analysis considers phosphorus loading from the historic

date of septic system installation and not only the present time. Therefore, typical phosphorus values published in literature are the best available information and most accurately reflect the conditions that have loaded the Spokane Valley soils historically.

- *Determine the local phosphorus soil adsorption capacity.*

Written justification for the soil phosphorus adsorption capacity is included in the revised phosphorus loading analysis for Appendix B of the Wastewater Facilities Plan Amendment.

- *Determine the local phosphorus retardation factor to account for phosphorus attenuation in groundwater.*

Please see the response to Comment 9.

- *Consider the effects of aquifer pumping, diffusion, and dispersion on phosphorus attenuation.*

The effects of aquifer pumping, diffusion, and dispersion are accounted for in the soil/aquifer attenuation factor, and were discussed in the Comment 9 response. This is further addressed in the updated phosphorus loading analysis for Appendix B of the Wastewater Facilities Plan Amendment.

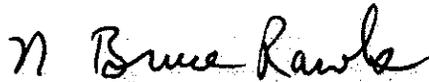
- *Expand the well monitoring network to reinstate the 25 well sampling locations that were sampled in 2004 but were not sampled in 2006.*

Spokane County will continue to collect samples from the monitoring wells and production wells, but cannot assure that the same sample locations will be available for each future monitoring period.

Thank you for the time that you have invested into meeting with us, and in preparing your review comments. We believe that this collaboration has produced a stronger and more scientific analysis of phosphorus reductions associated with the Septic Tank Elimination Program for our Delta Elimination Plan.

Please let us know if you have any additional questions or would like to meet on this subject again. If not, we look forward to your response to this letter, to revised Chapter 11, and to revised Appendix B. At that time, we will incorporate these materials into our Draft 2006 Wastewater Facilities Plan Amendment for final submittal to Ecology and for approval by Ecology.

Sincerely,
SPOKANE COUNTY



N. Bruce Rawls, P.E.
Spokane County Utilities Director

Cc: Richard Koch, (Water Quality Section)
Dave Moss, P.E. (Spokane County Public Utilities)
David L. Clark, P.E. (HDR Engineering, Inc.)
Dr. Michael Murray, PhD (HDR Engineering, Inc.)



STATE OF WASHINGTON
DEPARTMENT OF ECOLOGY

4601 N Monroe Street • Spokane, Washington 99205-1295 • (509)329-3400

March 20, 2007

Mr. N. Bruce Rawls, P.E.
Utilities Division
Spokane County Public Works Department
1026 W. Broadway
Spokane, WA 99260-0430

Dear Mr. Rawls:

RE: Draft Final County of Spokane's Wastewater Facilities Plan

The Draft Final County of Spokane's Wastewater Facilities Plan Amendment was reviewed by Ecology and comments were submitted on February 8, 2007, with the provision that comments on Chapter 11 (Phosphorus Management Plan) and Appendix B (Onsite Sewage Disposal System Phosphorus Loading Estimate) would be forthcoming in the near future. Please accept these comments into the public comment record that Ecology is now submitting. The following comments formalize the discussion that the County and Ecology had on February 28, 2007.

The Wastewater Facilities Plan was reviewed by Ecology to evaluate if WAC 173-201A-450 water quality offset conditions have been satisfactorily met. Our review suggests that there are offsets with the Septic Tank Elimination Program; however, there is an unacceptable level of uncertainty regarding the quantity and timing of the offsets. Satisfactorily meeting the following conditions of WAC 173-201A-450 is needed to diminish that uncertainty so that Ecology can approve the Wastewater Facilities Plan:

Water quality offsets may be allowed by the department when all of the following conditions are met:

- a) Water quality offsets must target specific water quality parameters
- b) The improvements in water quality associated with creating water quality offsets for any proposed new or expanded actions must be demonstrated to have occurred in advance of the proposed action.
- c) The technical bases and methodology for the water quality offsets is documented through a technical analysis of pollutant loading and that analysis is made available for review by the department. The methodology must incorporate the



uncertainties associated with any proposed point or nonpoint source controls as well as variability in effluent quality for sources and must demonstrate that an appropriate margin of safety is included. The approach must clearly account for the attenuation of the benefits of pollution controls as the water moves to the location where the offset is needed.

- d) Point or nonpoint source pollution controls must be secured using legal binding instruments between any involved parties for the life of the project that is being offset. The proponent remains solely responsible for ensuring the success of offsetting activities for both compliance enforcement purposes.
- e) Only the proportion of the pollution controls which occurs beyond existing requirements for those sources can be included in the offset allowance.
- f) Water quality offsets must meet antidegradation requirements in WAC 173-201A-300 through 173-201A-330 and federal antibacksliding requirements in CFR 122.44(I).

Comments

Chapter 11: Phosphorus Management Plan

Comment 1: The significance of offsets and requirements of WAC 173-201A-450 and how the Phosphorus Management Plan meets these requirements is not apparent in Chapter 11. The need for offsets appears critical to the County's decision to focus on the Septic Tank Elimination Program offset opportunities; however, that strategy is not self evident. Please make the strategy self evident, particularly by including more detailed discussion of the significance and requirements of WAC 173-201A-450 and how each water quality offset requirement is met by the Phosphorus Management Plan.

Comment 2: Chapter 11 does not provide much detail on Reuse. While Ecology is aware that a further effort is planned in the near future, some discussion in terms of possible "what if" scenarios is appropriate.

Comment 3: A Wastewater Treatment Plant does not operate at the design effluent limitations immediately upon start up; therefore, please include a margin of safety to account for this is.

Appendix B: General Comments

Comment 4: Please add background information that describes the Spokane Valley - Rathdrum Prairie aquifer, including its characteristics (i.e. kinetics and transmissivity) and its interaction with the Spokane River.

Appendix B: Onsite Sewage Disposal Systems Phosphorus Loading Estimate

Breakthrough Analysis

Comment 5: Please discuss the available methods to predict time to breakthrough and why the selected methods were chosen.

Comment 6: It appears to Ecology that a hybrid of Montana DEQ and Idaho DEQ was used. To help us better understand the need for what we perceive as a hybrid, please include a breakthrough analysis that adheres to Montana DEQ methods and recommendations and one that adheres to Idaho DEQ methods and recommendations. Please use this comparison to substantiate the use of the hybrid model and associated input values.

- The use a soil phosphorus adsorption capacity of 150ppm in calculations needs justification. Verbal explanation has been given; however, Ecology needs written justification provided in the text of the Wastewater Facilities Plan and not in a reference. Ecology would appreciate this input be justified based on knowledge of the local hydrogeology of the Spokane valley.
- Include the variable 'Distance from Drainfield to Surface Water' in the breakthrough analysis.

Comment 7: Please add discussion on the rationale/justification for 1) omitting the variable 'Distance from Drainfield to Surface Water' and 2) modifying the values used in the breakthrough analysis currently presented in Appendix B.

Comment 8: Please add a summary table of breakthrough analyses performed, including inputs and results, so that the analyses may be readily compared.

Soil/Aquifer Retention Factor

Comment 9: Please discuss the available methods to predict groundwater attenuation, and why the selected methods were chosen.

Comment 10: Ecology is inclined to request the use of an alternate method to account for phosphorous attenuation in the groundwater. Better justification of the soil/aquifer retention factor method applied in the current analysis is needed to ensure it is scientifically defensible because at the moment, Ecology has yet to be convinced it is appropriate to apply this method to the Spokane River watershed. The currently proposed soil/aquifer retention factors were developed using data from 47 north temperate lakes as part of an empirical phosphorus lake model developed by EPA (Reckhow 1980). Per EPA, "The result is a set of phosphorus export coefficients that are generally representative of the watershed conditions described." (Reckhow 1980). EPA

further states, "A few limitations on the use of the model should be mentioned now. Since the model was constructed only from lakes within the north temperate zone, it should be applied only to lakes within this zone." (Reckhow 1980). The 47 north temperate lakes used to develop the model were located in Michigan (W. Reckhow, Duke University, personal communication).

Annual Average Groundwater Phosphorus Loading/Discussion and Summary of Loading Analysis

Comment 11: There appears to be a contradiction between Chapter 11 and Appendix B. Chapter 11 proposes that the Septic Tank Elimination Program will reduce phosphorus loading to the aquifer; however, Figures 2 and 3 in Appendix B suggest that phosphorus loading to the aquifer is increasing. Please discuss why phosphorus loading to the aquifer has increased during the on-going Septic Tank Elimination Program, what trend is expected in the future, and why the trend is expected.

Comment 12: Please discuss why fewer well sampling data were used for the 2006 estimate of aquifer loading as compared to the 2004 estimate, and the implications of using fewer data. The annual average groundwater total phosphorus concentrations were developed using inverse distance weighted interpolation of data collected from 69 wells in 2004 and 44 wells in 2006. The interpolation results were then used to estimate the annual average aquifer loading, with 10.7 lbs/day estimated using 2004 data and 32.0 lb/s day estimated using 2006 data. However, concentration data from 25 wells were not included in the 2006 interpolation and loading estimate. A review of Figures 2 and 3 indicates that these 25 wells were those with the lowest measured concentrations in 2004 (0 – 5 µg/L). Are these data available? If so, please include them in the 2006 loading estimate. If the data were omitted for a reason, please provide that rationale to Ecology. If the data are not available, please see the recommendations at the end of this letter.

Recommendations

In sum these are Ecology's concerns, yet to be adequately addressed:

- Evaluate and discuss groundwater flow paths, timing, and gaining/losing reaches of the Spokane River to refine the scope of the breakthrough analysis to only those septic tanks that are hydrologically connected to the river within the appropriate time.
- Determine local septic tank effluent quality.
- Determine the local phosphorus soil adsorption capacity.
- Determine the local phosphorus retardation factor to account for phosphorus attenuation in groundwater.

Mr. N. Bruce Rawls, P.E.
March 20, 2007
Page 5

- Consider the effects of aquifer pumping, diffusion, and dispersion on phosphorus attenuation.
- Expand the well monitoring network to reinstate the 25 well sampling locations that were sampled in 2004 but were not sampled in 2006.

Thank you for the opportunity to provide comments. Ecology looks forward to discussing our comments with you at the meeting scheduled for March 29, 2007. If you have any questions or need any additional information, please don't hesitate to contact me at (509) 329-3514.

Sincerely,



Drea Traeumer, Hydrologist
Water Quality Section

DT:dw

cc: Dave Clark, P.E., HDR Engineering Inc.
Dave Moss, P.E., Spokane Co. Utilities
Jim Bellatty, Department of Ecology
Dave Knight, Department of Ecology
Len Bramble, P.E., Department of Ecology
Kim Sherwood, P.E., Department of Ecology
Richard Koch, P.E., Department of Ecology

References

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Reckhow, K.H., Beaulac, M.N, and Simpson, J.T., 1980, Modeling phosphorus loading in lake response under uncertainty: A manual and compilation of export coefficients. U.S. Environmental Protection Agency, EPA 440/5-80-011.

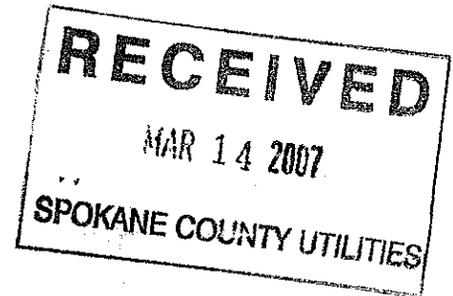
Washington Administrative Code 173-201A-450 Water quality offsets.
<http://apps.leg.wa.gov/WAC/default.aspx?cite=173-201A-450>



STATE OF WASHINGTON
DEPARTMENT OF HEALTH
OFFICE OF ENVIRONMENTAL HEALTH AND SAFETY
1500 West Fourth Avenue • Suite 403 • Spokane, Washington 99204-1656

March 12, 2007

Dave Moss, Water Reclamation Mgr
Spokane County Utilities
1026 West Broadway Avenue
Spokane, WA 99260-0430



RE: Spokane County Draft 2006 Facilities Plan Amendment, Departmental Review

Dear Mr. Moss:

The Draft 2006 Facilities Plan Amendment Received in our office on December 21, 2006 has been reviewed. Based on this review, this plan will be conditionally approved contingent upon receipt of the Water Reclamation and Reuse Plan in conformance with this plan upon receipt of the final version of the plan. I have also made note of some comments that should strengthen and potentially clarify the Water Reclamation and Reuse Plan that I will be glad to informally discuss with you at your convenience.

RCW 43.208.020 authorizes fees for services for the review of engineering plans, reports, and construction documents. A fee will be charged for the review and approval of your engineering documents. You will receive an invoice for payment upon completion of review and approval of the documents. Payment is due at that time. The fee is based on the time required to complete the review at a flat hourly rate which is currently \$99.00 per hour, but is subject to change.

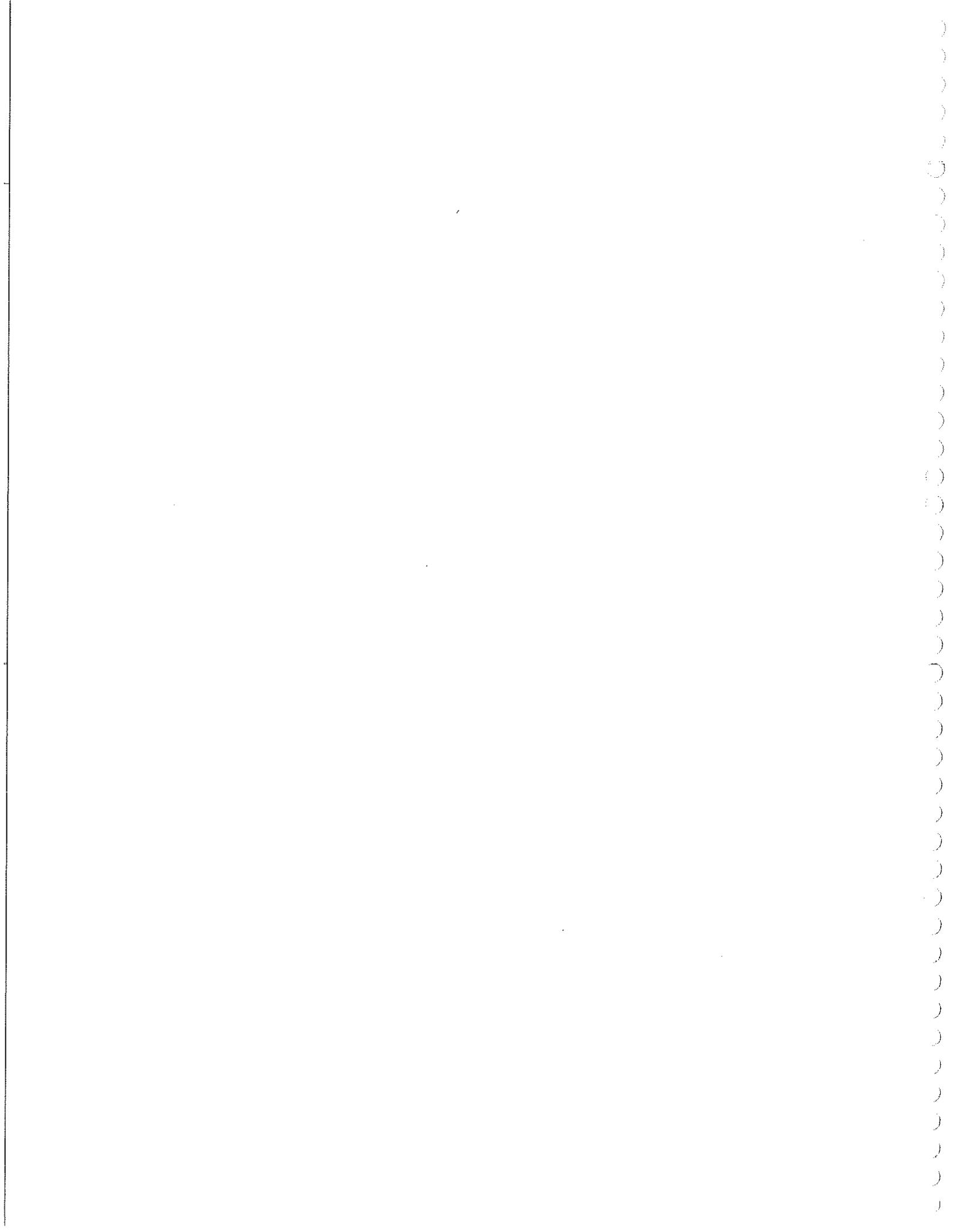
If you have any questions, please feel free to contact me by telephone at (509) 456-2466 or email at craig.riley@doh.wa.gov.

Sincerely,


Craig L. Riley, P.E.
Water Reclamation & Reuse Program
Environmental Health Division

cc: Spokane County Regional Health District
Jim Bellaty, WA Dept. of Ecology, ERO, Spokane
Dave Clark, HDR Inc.

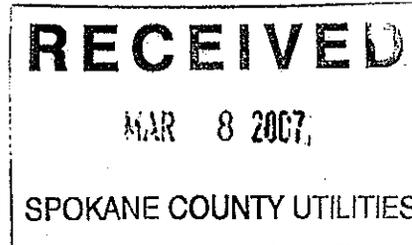






PUBLIC WORKS & UTILITIES
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FAX (509) 625-6274

March 7, 2007



Mr. Bruce Rawls, Director
Spokane County Utilities, PWK-4
1116 W. Broadway Ave.
Spokane, WA 99260-0430

Re: City of Spokane Comments on the County December 2006 Addendum to:
2002 Regional Wastewater Treatment Plant SEIS
2002 Wastewater Facilities Plan EIS

Dear Mr. Rawls:

The City of Spokane offers the following comments regarding the above Addendum:

- 1) Page 2-10, 2nd to last bullet: "that Flows are approaching a Peak of 10.5 MG."

Based on City/County agreements, the County is allowed 10 MGD. Peaks are to be addressed on the County's side of the collection system.

- 2) Page 2-14, first full paragraph: "Ability to operate the membrane filters and address flows greater than the County wants to design for" [apparent intent is to offload these added flows to the City of Spokane system]

The County is allowed a total of 10 MGD from the 3 connection points. The total cannot exceed 10 MGD. Any wastewater that is sent or off loaded into the City system must be of Standard Strength Sewage and meet applicable discharge limits of the City's Pretreatment and Sewer Use ordinances. An intention to Off Load certain amounts of Flow may require the Industries hooked to this County Plant to ALSO have to meet the City's Pretreatment Standards. This requires added legal/regulatory review.

- 3) Route of SVI as depicted in figure 3-3 top map:

The Havana corridor is not available for routing the Spokane Valley Interceptor to the new plant site. No provisions have been made in the Bridging the Valley - Havana Bridge project for this to occur. With rerouting existing major City utilities and the bridge itself, use of this right of way is no longer available. Alternative routing is required.

Mr. Bruce Rawls
Spokane County Utilities
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4) Page 3-8, 5th paragraph, last line: "For additional discussion, see Section 3.4."

As you know from previous correspondence, the City believes County studies indicate a slight increase in risk to City drinking water quality with the River discharge located on the Rebecca Street alignment (the risk would be greater with an aquifer discharge). So the referenced section here was of interest to us, but it appears to have been left out of the addendum.

Should you have any questions please don't hesitate to contact me at 625-6320 or dmandyke@spokanecity.org.

Sincerely,



Dave Mandyke
Acting Director

cc: Dale Arnold
Brad Blegen
John Mercer
Lloyd Brewer



STATE OF WASHINGTON
DEPARTMENT OF ECOLOGY

4601 N Monroe Street • Spokane, Washington 99205-1295 • (509)329-3400

February 8, 2007

Mr. Bruce Rawls, P.E.
Utilities Division
Spokane County Public Works Dept.
1026 West Broadway
Spokane, WA 99260-0430

RECEIVED

FEB 12 2007

SPOKANE COUNTY UTILITIES

RE: Spokane County Wastewater Facilities Plan Amendment - Draft of December 2006

Dear Mr. Rawls:

The draft Wastewater Facilities Plan has been reviewed and Ecology has a number of comments to assist in the completion of this portion of the Facilities Planning process.

Table ES-1 and Table 2-8: The winter effluent characteristics imply a shorter MCRT. Though we have discussed them, there is no written discussion of the treatment goals justifying the shorter MCRT. At other times there has been acknowledgement that public perceptions and the public interest in various pollutants (i.e. destruction of pharmaceuticals) need to be assessed and accounted for. That may justify a longer MCRT in winter. Also the lead bullet on page 6-6 recommends a minimum SRT of 15 days due to MBR operational considerations.

Table ES-3: The figure's title could benefit from a time reference.

Table 2-8 Potential Effluent Quality Requirements: This table should probably be deleted. It shows TP concentrations for the spring and fall that are much higher than will be allowed. The CBOD and TSS concentrations are higher than it is anticipated based on the draft TMDL and current model runs. While toxicity considerations may justify the ammonia concentrations allowed, the TMDL is also considering NBOD and lower concentrations are anticipated in the final output. It may be that this table misleads DBO RFP contract respondents.

Page 2-24: The opening paragraph says "To date, the summer permit season has not started before May 1." In the case of the Riverside Park Water Reclamation Facility, the summer season starts on or about April 15. The NPDES permits currently in draft are interpreting the Foundation Concepts summer season of April through October as beginning on April 1.

Page 2-24, the fourth bullet: The CBOD₅ limits and ammonia limits (or NBOD₅) will be based on the WLA of the final DO TMDL.

Page 2-25: The second bullet on temperature was written prior to Ecology issuing revised water quality standards. The following excerpt is from the revisions of December 2006.



(c) **Aquatic life temperature criteria.** Except where noted, water temperature is measured by the 7-day average of the daily maximum temperatures (7-DADMax). Table 200 (1)(c) lists the temperature criteria for each of the aquatic life use categories.

Table 200 (1)(c) Aquatic Life Temperature Criteria in Fresh Water

Category	Highest 7-DADMax
Char Spawning	9°C (48.2°F)
Char Spawning and Rearing	12°C (53.6°F)
Salmon and Trout Spawning	13°C (55.4°F)
Core Summer Salmonid Habitat	16°C (60.8°F)
Salmonid Spawning, Rearing, and Migration	17.5°C (63.5°F)
Salmonid Rearing and Migration Only	17.5°C (63.5°F)
Non-anadromous Interior Redband Trout	18°C (64.4°F)
Indigenous Warm Water Species	20°C (68°F)

(i) When a water body's temperature is warmer than the criteria in Table 200 (1)(c) (or within 0.3°C (0.54°F) of the criteria) and that condition is due to natural conditions, then human actions considered cumulatively may not cause the 7-DADMax temperature of that water body to increase more than 0.3°C (0.54°F).

(ii) When the background condition of the water is cooler than the criteria in Table 200 (1)(c), the allowable rate of warming up to, but not exceeding, the numeric criteria from human actions is restricted as follows:

(A) Incremental temperature increases resulting from individual point source activities must not, at any time, exceed $28/(T+7)$ as measured at the edge of a mixing zone boundary (where "T" represents the background temperature as measured at a point or points unaffected by the discharge and representative of the highest ambient water temperature in the vicinity of the discharge).

(B) Incremental temperature increases resulting from the combined effect of all nonpoint source activities in the water body must not, at any time, exceed 2.8°C (5.04°F).

(iii) Temperatures are not to exceed the criteria at a probability frequency of more than once every ten years on average.

Please note that foot notes for WRIA 54 and 57 (the Lower and Middle Spokane River sections) have a different temperature equation: $t=34/(T+9)$

Temperature shall not exceed a 1-DMax of 20.0°C due to human activities. When natural conditions exceed a 1-DMax of 20.0°C, no temperature increase will be allowed which will raise the receiving water temperature by greater than 0.3°C; nor shall such temperature increases, at any time, exceed $t = 34/(T + 9)$.

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Page 2-27, section 2.7: It should be noted that for the anticipated reuse applications, water reclamation to Class A standards will include nitrogen removal.

Page 2-28: It is our understanding that the schedule for updating the Biosolids Rule is now projected to be June 2007.

Page 4-16: Please be advised that the draft NPDES permit will require additional source control of mercury. The current draft language is as follows:

The Permittee shall develop and submit to the Department of Ecology a Mercury abatement and control plan beginning with a Dental plan. The plan shall be expanded as the Department of Ecology develops and releases further guidance. The Mercury Control Plan shall be submitted to the Department of Ecology by December 1, 2008.

Mercury Plan development guidance can be found at the following locations:

Ecology mercury web site <http://www.ecy.wa.gov/programs/eap/pbt/mercuryplan.html>
For Dental Plan guidance <http://www.ecy.wa.gov/dentalbmeps/index.html>
Reduction plan guidance <http://www.ecy.wa.gov/biblio/0303001.html>

Chapter 5: It was noted that the Effluent End Use Alternatives does not include a Public Education element.

Page 6-6, section 6.3.3: The first bullet recommends a minimum aerobic SRT of 15 days for the MBR design. This generally implies nitrification, yet Table 2-8, Table 6-2 the bottom of page 6-15 and elsewhere indicate that at least in winter this may not be the case.

In addition, there is increasing interest from the public in various organics in wastewater such as endocrine disruptors and pharmaceuticals. Current research indicates that the longer SRTs typical for MBRs are effective in removing significant portions of these constituents.

Table 6-3 does not give information on alkalinity and pH. The City's RPWRF needs to add acid to control pH and is modifying the aeration basins and operations to nitrify/denitrify to add alkalinity and manage pH. For the county facility, the effluent alkalinity and pH should be checked. Discussion of pH, alkalinity, and nitrification/denitrification is also missing on page 7-2, page 9-8, and table 9-6.

Chapter 6 process schematics: While removal of nutrients with side stream treatment is a decision for the DBO team, if they could be at least encouraged to discuss pros and cons from their perspective, a better project might result.

Page 9-2, Pretreatment Focus on Metals: Discussion of mercury source control should be added.

Page 9-13: Please elaborate on the site remediation.

Page 9-15: Methanol addition is shown in the process schematics. However, the unit cost is not given on the top of the page, so it at least appears that the cost was omitted.

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Table 10-1: With the previous wastewater facilities plan and EIS, the section 106 requirements were addressed. Does this table anticipate further section 106 studies for the forth coming water reclamation and reuse report?

Comments on Chapter 11 and appendix B will be forth coming in the near future.

These are my comments and suggestions at this time. If you have any questions or need any additional information, please do not hesitate to contact me at (509) 329-3519.

Sincerely,



Richard A. Koch, P.E.
Water Quality Section

RAK:dw

Enclosure: page 106 and 107 of water quality standards for Spokane River

cc/enc: Dave Clark, P.E.; HDR Engineering Inc.

Dave Moss, P.E., Spokane Co. Utilities

TABLE 602 Use Designations for Fresh Waters by Water Resource Inventory Area (WRIA)	Aquatic Life Uses				Recreation Uses			Water Supply Uses				Misc. Uses						
	Char Spawning/Rearing	Core Summer Habitat	Spawning/Rearing	Rearing/Migration Only	Redband Trout	Warm Water Species	Ex Primary Cont	Primary Cont	Secondary Cont	Domestic Water	Industrial Water	Agricultural Water	Stock Water	Wildlife Habitat	Harvesting	Commerce/Navigation	Bowling	Aesthetics
Okanogan River																		
WRIA 50 Foster																		
There are no specific waterbody entries for this WRIA																		
WRIA 51 Spelam																		
There are no specific waterbody entries for this WRIA																		
WRIA 52 Sappal																		
There are no specific waterbody entries for this WRIA																		
WRIA 53 Lower Lake Roosevelt																		
There are no specific waterbody entries for this WRIA																		
WRIA 54 Lower Spokane																		
Spokane River from mouth to Long Lake Dam (river mile 33.9) ¹																		
Spokane River from Long Lake Dam (river mile 33.9) to Nine Mile Bridge (river mile 58.0) ²																		
Spokane River from Nine Mile Bridge (river mile 58.0) to the Idaho border (river mile 96.5) ¹																		
Notes for WRIA 54:																		
1. Temperature shall not exceed a 1-DM _{Max} of 20.0°C due to human activities. When natural conditions exceed a 1-DM _{Max} of 20.0°C, no temperature increase will be allowed which will raise the receiving water temperature by greater than 0.3°C; not shall such temperature increases, at any time, exceed t = 34/(T + 9).																		

TABLE 602

Use Designations for Fresh Waters by Water Resource Inventory Area (WRIA)	Aquatic Life Uses			Recreation Uses			Water Supply Uses				Misc. Uses							
	Char Spawning/Rearing	Core Summer Habitat	Spawning/Rearing	Rearing/Migration Only	Redband Trout	Warm Water Species	Ex Primary Cont	Primary Cont	Secondary Cont	Domestic Water	Industrial Water	Agricultural Water	Stock Water	Wildlife Habitat	Harvesting	Commerce/Navigation	Boating	Aesthetics
2. a. The average euphotic zone concentration of total phosphorus (as P) shall not exceed 25 µg/L during the period of June 1 to October 31.																		
b. Temperature shall not exceed a 1-DMax of 20.0°C, due to human activities. When natural conditions exceed a 1-DMax of 20.0°C, no temperature increase will be allowed which will raise the receiving water temperature by greater than 0.3°C; nor shall such temperature increases, at any time, exceed t = 34/(T + 9).																		
3. Temperature shall not exceed a 1-DMax of 20.0°C due to human activities. When natural conditions exceed a 1-DMax of 20.0°C no temperature increase will be allowed which will raise the receiving water temperature by greater than 0.3°C; nor shall such temperature increases, at any time exceed t = 34/(T + 9).																		
WRIA 55 Middle Spokane																		
There are no specific waterbody entries for this WRIA.																		
WRIA 56 Hamman																		
There are no specific waterbody entries for this WRIA.																		
WRIA 57 Middle Spokane																		
Lake Creek and all tributaries.																		
Spokane River from Nine Mile Bridge (river mile 58.0) to the Idaho border (river mile 96.5). ¹																		
Notes on WRIA 57:																		
1. Temperature shall not exceed a 1-DMax of 20.0°C due to human activities. When natural conditions exceed a 1-DMax of 20.0°C no temperature increase will be allowed which will raise the receiving water temperature by greater than 0.3°C; nor shall such temperature increases, at any time exceed t = 34/(T + 9).																		
WRIA 58 Middle Lake Roosevelt																		
There are no specific waterbody entries for this WRIA																		
WRIA 59 Colville																		

CENTER FOR JUSTICE

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February 7, 2007

Bruce Rawls
Spokane County Utilities
1026 W. Broadway Ave.
Spokane, WA 99260-0430

Re: Comments on Spokane County 2006 Wastewater Facilities Plan Amendment

Dear Mr. Rawls,

Thank you for the opportunity to comment on the Spokane County's 2006 Wastewater Facilities Plan Amendment posted on Spokane County's website for public review. The following comments are submitted on behalf of the Upper Columbia River Group of the Sierra Club.

BACKGROUND

Spokane County plans to build a new wastewater treatment plant which would discharge effluent to the Spokane River. The Spokane River is § 303(d) listed for several parameters, including PCBs and dissolved oxygen. This § 303(d) listing under the Clean Water Act (CWA) means that the current wastewater technologies and other pollution control activities are insufficient to protect the health of the river and that more stringent measures must be applied. *See* 33 U.S.C. § 1313(d); 40 C.F.R. § 130.7

Because of this listing, the Washington State Department of Ecology issued a draft TMDL or water quality clean-up plan for dissolved oxygen in October 2004. According to the technical analysis supporting the TMDL, effluent concentrations for total phosphorus from each point source cannot exceed 10 ug/l without causing or contributing to water quality violations. Under the law, existing dischargers to the river, who already have NPDES permits, will get a compliance schedule to meet these stringent limits. As a new discharger, however, the County cannot get an NPDES permit to discharge into the river unless it can show that its discharge, upon commencement, meets the TMDL's criteria of 10 ug/l.

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An NPDES permit is required for all discharges of pollutants. 33 U.S.C. § 1342(a). Ecology issues these permits, but EPA has the final approval. 33 U.S.C. § 1342(a)(5)(b). New discharges into critically impaired waterways are prohibited unless the State has performed a load allocation for each pollutant to be discharged, there are sufficient remaining pollutant load allocations to allow discharge, and the existing dischargers into that segment are subject to compliance schedules designed to bring the plant into compliance with applicable water quality standards. 40 C.F.R. § 122.4.

Ecology has stated that the County's plant may be able to get a permit if the effluent from its new plant meets the TMDL limit of 10 ug/l through a combination of technological end-of-the-pipe reductions and offsets from other phosphorus reduction strategies, such as water reclamation and reuse or septic tank elimination. In order to qualify for an offset, the County would have to demonstrate that it had already removed the necessary amount of phosphorus from the river prior to commencement of discharge such that its effluent would not increase loading. WAC 173-201A-450. This may be difficult to do. Thus, it is clearly in the County's best interest to choose a technology that reduces phosphorus to the lowest level possible in a cost effective manner.

In 2003, the County submitted its 2002 Wastewater Facilities Plan and 2003 Wastewater Facilities Plan Amendment to Ecology for approval. The facilities plan called for discharging effluent into the Spokane River during the critical summer months at 100 ug/l, well above the TMDL limit. *See* 2003 Amendment Ch. 2, Table 2-1. Not only was discharge intended to a § 303(d) listed waterway, the discharge was not in conformity with the draft TMDL, and there were no sufficient remaining pollutant load allocations for a new plant, all in violation of the law.

Nevertheless, Ecology initially approved the County facilities plan in February of 2003. *See* 2006 Amendment Ch. 1.1.4. However, Ecology revoked that approval six months later. In its August 2, 2004 letter, Ecology wrote:

Ecology and the U.S. Environmental Protection Agency (EPA) have determined that we will not be able to issue an NPDES permit for a new wastewater treatment facility based on the facility plan as approved by Ecology on February 28, 2003. In addition, an SRF loan cannot be awarded to the county with the scope of work discussed in the facility plan at this time, based on the scientific and technical information that is currently available regarding the dissolved-oxygen TMDL.¹

¹ This letter is included as Exhibit I to this letter. The facility plan states only that Ecology approved the 2003 facility plan and omits the fact that Ecology withdrew its approval in August 2004. (2006 Amendment Ch.1.1.4 p. 1-3). This is misleading and should be corrected. Moreover, its omission is a violation of SEPA which requires that the County consult with Ecology and EPA regarding the impacts of the plant and ensure that these agencies' comments, statements or views accompany the proposal through the SEPA process. RCW 43.21C.030(d).

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Ecology then extended an \$8.5 million loan to the County to upgrade the facilities plan in conformity with the TMDL. Now, two and a half years later, the County tendered the most recent iteration of its plan, the 2006 Amendment which is under review. Unfortunately, our review indicates that this amendment once again fails to comport with the requirements of the TMDL and other state and federal laws, for the reasons stated in the following comments.

COMMENTS

1. The 2006 Amendment Fails To Provide Assurances That The County's Discharge Will Achieve Compliance With The TMDL's 10 Ug/L Phosphorus Limits.

Two years after the revocation of approval for the County plant, Ecology issued a document entitled the 2006 Foundational Concepts for the Spokane River TMDL Managed Implementation Plan. This document resulted from over a year of negotiations through the TMDL Collaboration between Ecology, the Spokane River dischargers, and interested stakeholders concerning the DO TMDL and lays out possible permitting requirements for the County.² In order to receive an NPDES permit for discharge into the Spokane River under this document, the County must submit an engineering report for the plant showing: (1) how the most effective feasible, phosphorus technology was selected and (2) that this technology, in combination with developed offsets, will achieve compliance with the 10 ug/l phosphorus limit.

The County's plant is designed for 8 mgd annual average flow and the chosen technology, Membrane Bioreactor (MBR) with biological nutrient removal and chemical polishing, is expected to achieve at least 50 ug/l. As calculated by the County, "effluent phosphorus of 50 ug/l for 8 mgd annual average flow is 3.34 lb/day. Effluent phosphorus of 50 ug/l for 8 mgd annual average flow is 0.67 lbs/day. The difference of at least 2.67 lbs/day phosphorus is the target 'delta' elimination for Spokane County." See 2006 Amendment at Ch.11.1.

Because the river is over-assimilated for phosphorus, any County discharge to the river must meet concentrations of 10 ug/l upon commencement of discharge unless the County has created "room" in the river for new loading. The only way to do that, according to the Foundational Concepts document, is to reduce current loading by the difference between the County's discharge concentration and the TMDL limit.³ Thus, if the County's technology only reduces effluent

² The Sierra Club was an active participant in the TMDL Collaboration but, in the end, was unable to endorse the Foundational Concepts. The Sierra Club's letter on the Foundational Concepts is included as Exhibit 2.

³ Because the river is currently over-assimilated for phosphorus, it would seem the only way to avoid causing or contributing to violations would be to ensure that any new loading is below 10 ug/l, or background, including that from septic.

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concentrations to 50 ug/l, the County must show that it has reduced phosphorus loading to 10 ug/l through other phosphorus reducing strategies, or offsets.

WAC 173-201A-450 regulates offsets and provides:

(1) A water quality offset occurs where a project proponent implements or finances the implementation of controls for point or nonpoint sources to reduce the levels of pollution for the purpose of creating sufficient assimilative capacity to allow new or expanded discharges. The purpose of water quality offsets is to sufficiently reduce the pollution levels of a water body so that a proponent's actions do not cause or contribute to a violation of the requirements of this chapter and so that they result in a net environmental benefit. Water quality offsets may be used to assist an entity in meeting load allocations targeted under a pollution reduction analysis (such as a total maximum daily load) as established by the department. Water quality offsets may be used to reduce the water quality effect of a discharge to levels that are unmeasurable and in compliance with the water quality antidegradation Tier II analysis (WAC 173-201A-320).

(2) Water quality offsets may be allowed by the department when all of the following conditions are met:

(a) Water quality offsets must target specific water quality parameters.

(b) The improvements in water quality associated with creating water quality offsets for any proposed new or expanded actions must be demonstrated to have occurred in advance of the proposed action.

(c) The technical basis and methodology for the water quality offsets is documented through a technical analysis of pollutant loading, and that analysis is made available for review by the department. The methodology must incorporate the uncertainties associated with any proposed point or nonpoint source controls as well as variability in effluent quality for sources, and must demonstrate that an appropriate margin of safety is included. The approach must clearly account for the attenuation of the benefits of pollution controls as the water moves to the location where the offset is needed.

(d) Point or nonpoint source pollution controls must be secured using binding legal instruments between any involved parties for the life of the project that is being offset. The proponent remains solely responsible for ensuring the success of offsetting activities for both compliance and enforcement purposes.

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(e) Only the proportion of the pollution controls which occurs beyond existing requirements for those sources can be included in the offset allowance.

(f) Water quality offsets must meet antidegradation requirements in WAC 173-201A-300 through 173-201A-330 and federal antibacksliding requirements in CFR 122.44(l).

Any offsets claimed by the County to meet its “delta” must meet the criteria for offsets described above. As described in the 2006 Amendment, the County plans to achieve offsets through a combination of actions including water conservation, reclaimed water and reuse, source control programs, regional phosphorus reduction programs and septic tank elimination.

The only delta elimination action for which the County provided technological and loading analyses, however, was the pre-existing septic elimination program. The 2006 Amendment does provide general descriptions of actions the County might take in the future, but the County did not include technical loading analyses or detailed plans for these actions. Hence these options do not meet the regulatory criteria for offsets and Ecology may not rely on them in determining whether this facility plan meets the TMDL requirements.

The County did tender a technical memorandum on loading from septic systems. See 2006 Amendment, Appendix B, Spokane County Onsite Sewage Disposal Systems Phosphorus Loading Estimate Technical Memorandum (HDR Report). Unfortunately, this memorandum is not scientifically defensible and likewise fails to meet the criteria of WAC 173-201A-450.

Prior to the finalization of the Foundation Concepts document, Sierra Club provided Ecology with a review of the County’s initial Phosphorus Loading Estimate Technical Document conducted by Gary Andres, a hydrogeologist with expertise in the Spokane Valley –Rathdrum Prairie Aquifer.⁴ A copy of this assessment is included as Exhibit 3. That initial estimate warned that the proposal to provide phosphorus offsets through the septic elimination program was not scientifically defensible and failed to meet the vigorous standards of Ecology’s offset regulation (WAC 173-201A-450). Mr. Andres has provided an additional review of the latest version of the Spokane County Onsite Sewage Disposal Systems Phosphorus Loading Estimate Technical Memorandum, included as Exhibit 3.1. This assessment concludes that little additional information has been provided to demonstrate that the offset proposal is either scientifically or legally defensible.

⁴ Mr. Andres’ resume is included as Exhibit 4.

Specifically, this assessment finds that the HDR report fails to include a sensitivity analysis, adequately address seasonal variations, verify conclusions with field data, or adequately consider a soil/aquifer retention factor. *See generally* Exhibit 3.1. In considering whether the HDR satisfies the requirements of Ecology's offset regulation, the assessment concludes:

The study does not quantify uncertainty in both P loading and migration to the river, address variability in the effluent quality, provide an appropriate margin of safety (no sensitivity analysis), or account for attenuation as P migrates in the SVRP.

These shortcomings clearly indicate that an inadequate strategy for delta elimination has been developed. The County must demonstrate that it will meet the 10 ug/l limit through a combination of technology and delta elimination. Without additional offsets or more robust analysis to support the proposed septic offset, it appears the County has failed to meet this requirement.

The proposal to offset phosphorus discharges from the new plant is also problematic from legal and policy perspectives. WAC 173-201A-450(2)(e) requires that pollution offsets may be utilized only to the extent the offset allocation derives from new (i.e. not pre-existing) requirements. The Septic Tank Elimination Program, which the County proposes to use as an offset for phosphorus loading to the River, is a longstanding obligation of the County and does not qualify as pollution offset.

The STEP program commenced in 1985 when County voters approved a resolution to create an Aquifer Protection Area and to allow the County to impose a \$15 fee on property tax statements. A primary purpose of the fee was (and is) to construct sewer mains to eliminate septic systems and connect households to the City's sewage plant. The County has collected and spent tens of millions of property taxpayer dollars from this fund. In addition the County has received substantial funding from the State's Centennial Clean Water Fund, again on the order of tens of millions of dollars.

The obligation to utilize these funds to eliminate on-site sewage systems derives both from the County's own program as well as contracts with the State of Washington. This obligation pre-dates the TMDL and the discharge permit the County now wishes to obtain to allow discharge to the Spokane River. Removal of septic tanks from the Spokane Aquifer will not create a phosphorus "credit" over and above what will occur regardless of the new treatment plant.

The proposal to use septic elimination as an offset is a bad idea from a policy standpoint. Rewarding the County with a pollution offset credit for the septic elimination program creates an incentive for the County to promote the use of on-site septic systems for new home construction. Indeed, this is exactly what has

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occurred since the County conceived the idea of using STEP as an offset. In 2005, the County loosened the requirements for connecting to sewer mains. There has also been significant growth in septic systems in the last several years in Spokane County. There has been little effort by the County to limit or control growth in a manner that would reduce demand for septic permits.

In sum, the proposal to trade septic elimination for a phosphorus effluent load in the Spokane River is supported neither in science nor law. The County facilities plan should be revised to propose and assess credible, valid offsets rather than rely on a program that does not pass legal muster and prevent the County from obtaining necessary permits to construct a new treatment plant.

2. The County Failed To Adequately Study And Assess All Reasonable Treatment Alternatives To Phosphorus Removing Wastewater Technology And, In So Doing, Failed To Provide A Comprehensive Technology Selection Protocol For Choosing The Most Effective Feasible Technology For Seasonally Removing Phosphorus From Its Effluent.

The Foundational Concepts document requires the County's facilities plan to provide a comprehensive technology selection protocol for choosing the most effective feasible technology for seasonally removing phosphorus from its effluent. This requirement mirrors the State Environmental Protection Act which requires facilities plans such as this to study, develop, and describe appropriate alternatives to the proposed action. RCW 43.21C.030.

The 2006 Wastewater Facilities Plan Amendment is the fourth iteration of the County's plan. The County previously tendered a 2002 plan followed by 2003 and 2004 amendments.⁵ The 2006 Amendment presents its treatment technology alternatives analysis in Chapters 3 and 6. The amendment considers only four treatment technologies, but relies in part on the previous alternatives evaluation from the 2003 Amendment. Amendment 2006 Ch. 3.1 at 3-1 ("Much of the past facilities planning alternatives analysis and previous conclusions remain valid and are components of Spokane County's wastewater management program.")

This is problematic. In 2003, the County was seeking a technology to meet "anticipated" seasonal limits for total phosphorus of .5 mg/l or 500 ug/l. See 2003 Amendment Ch. 4., Table 4.2 at 4-4. Its preferred alternative, MBR, was expected to achieve only 100 ug/l. For this analysis, the County's effluent with offsets must meet 10 ug/l upon commencement of discharge. Instead of revamping the 2003 technology selection protocol to reflect the new limits, and reviewing the many plants nationwide using different technologies to achieve low

⁵ The 2004 Amendment was apparently withdrawn as it is no longer available on the Spokane County Utilities. See Regional Water Reclamation Facility website.

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phosphorus levels, the County simply took the alternative chosen in 2003, AWT Alternative 1 (formerly Alternative S7), and compared it to three alternatives: two MBRs and one conventional activated sludge system with tertiary membrane. *See* 2006 Amendment Ch. 6.3.2 at 6-5,6.⁶ No explanation is given as to why these four alternatives were the only ones chosen for consideration.

The 2003 alternatives selection protocol is of no assistance either. There, the County eliminated technologies from consideration because they relied on chemical addition for phosphorus removal. *See* 2003 Amendment Ch. 4.5.1 at 4-7. Yet, confusingly, the 2003 finalists were chosen precisely because “they would use chemical phosphorus removal.” *See* 2003 Amendment Ch. 4.7.2 at 4-34. Similarly, all four 2006 alternatives utilize chemical addition.

The 2006 Amendment selected a technology that is expected to meet concentration limits of 50 ug/l and lists no plants where the proposed technologies are currently being used with data to support their efficacy. Instead, it merely states that “effluent quality assumptions are based on experience from other facilities with similar process designs.” *See* 2006 Amendment, Ch. 6.3.2 at 6-5.

Yet, there are a number of facilities throughout the nation achieving low phosphorus. Indeed, EPA Region 10 will soon publish an inventory of exemplary wastewater treatment plants achieving low phosphorus concentrations, some of which have been achieving from 10 to 20 ug/l for years, all without such stringent permit limits as required here, and none of which are MBR. Instead, these facilities largely use BNR, chemical addition, and various forms of filtration. The following is a list of a few plants achieving exemplary phosphorus removal, none of which were reviewed or even mentioned by the County.

- Breckenridge S.D., Farmer’s Korner WWTP, CO
Capacity – 3 mgd
Type of treatment – BNR, chemical addition, filtration
Ave. Effluent Phosphorus Concentration – 7 ug/l
Range of monthly ave. phos. concentrations – 2 to 3 ug/l
- Summit County Snake River WWTP, CO
Capacity – 2.6 mgd
Type of treatment – BNR, chemical addition, filtration
Ave. Effluent Phosphorus Concentration – 10 ug/l
Range of monthly ave. phos. concentrations – 10 to 40 ug/l

⁶ The schematic of the 2003 preferred alternative presented in the 2006 Amendment, Ch. 6.3.2, Fig. 6-1 at 6-5, does not match that in the 2003 Amendment, Ch. 4.6.4, Fig. 4-6 at 4-20. The 2003 schematic included UV disinfection rather than chlorination and no membrane modules separate from the activated sludge, N/DN stage.

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- Pinery WWRF Parker, CO
Capacity – 2 mgd
Type of treatment – BNR, chemical addition, filtration
Ave. Effluent Phosphorus Concentration – 29 ug/l
Range of monthly ave. phos. concentrations – 21 to 74 ug/l

- Clean Water Services, Rock Creek WWTP, OR
Capacity – 39 mgd
Type of treatment – Chemical addition, filtration
Ave. Effluent Phosphorus Concentration – 70 ug/l
Range of monthly ave. phos. concentrations – 40 to 90 ug/l

- Stamford WWTP, Stamford, NY
Capacity – 0.5 mgd
Type of treatment – Chemical addition, filtration
Ave. Effluent Phosphorus Concentration – 11 ug/l
Range of monthly ave. phos. concentrations – 5 to 60 ug/l

- Walton WWTP, Walton, NY
Capacity – 1.55 mgd
Type of treatment – Chemical addition, filtration
Ave. Effluent Phosphorus Concentration – 10 ug/l
Range of monthly ave. phos. concentrations – 5 to 60 ug/l

- Milford WWTP, Milford, MA
Capacity – 4.8 mgd
Type of treatment – Multi-point chemical addition, filtration
Ave. Effluent Phosphorus Concentration – 70 ug/l
Range of monthly ave. phos. concentrations – 40 to 160 ug/l

- Alexandria Sanitation Authority, Alexandria, VA
Capacity – 54 mgd
Type of treatment – BNR, multi-point chemical addition, filtration
Ave. Effluent Phosphorus Concentration – 60 ug/l
Range of monthly ave. phos. concentrations – 40 to 100 ug/l

- Upper Occoquan Sewerage Authority WWTP, VA
Capacity – 42 mgd
Type of treatment – Chemical and tertiary filtration
Ave. Effluent Phosphorus Concentration – 80 ug/l
Range of monthly ave. phos. concentrations – 23 to 282 ug/l

- Fairfax County, Noman Cole WWTP, VA
Capacity – 67 mgd
Type of treatment – Chemical addition, filtration

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Ave. Effluent Phosphorus Concentration – 60 ug/l
Range of monthly ave. phos. concentrations – 20 to 130 ug/l

Although most of the above were not reaching the concentrations required here, it is important to note that they were not required to do so. With permits ranging from 50 ug/l to 180 ug/l, these plants had no incentive to spend the time and resources to reach lower phosphorus levels.

It is possible that a full scale MBR plant with chemical addition may succeed in reducing phosphorus to very low levels. The Arapahoe County Water and Wastewater Authority in the Denver metropolitan area operates a 2.4 mgd MBR facility with chemical addition and treats wastewater to below 50 ug/l.⁷ However, the County has failed to provide evidence that its chosen technology will do so to full scale.

In 2005, the City of Spokane conducted pilot testing of three technologies which claim to reduce phosphorus concentrations to low levels. These were Parkson's D2, dual sand filtration, US Filter's Trident HS-1, and Zenon's Zeeweed 500, an ultrafiltration membrane system. According to the City, all achieved target concentrations of under 50 ug/l with a majority of samples under 20 ug/l. Pilot testing has also been ongoing at the Hayden WWTP with BlueWater's BluePro Treatment, a dual sand filtration system. BlueWater reports results as low as 10 ug/l.

Interestingly, in recognition of the capabilities of BNR with chemical addition, the 2006 Alternative 3 includes these treatment methods in its design. *See* Amendment 2006 Ch. 6.3.6 at 6-10. Although the County rejected this alternative, it admits that various tertiary technologies such as Bluewater, Parkson, the Trident or other microfiltration "may be investigated in demonstration testing at the new plant." *Id.* at 6-11. The advantage the County has over existing dischargers is that it can build its plant to meet the requirements of the CWA now. It does not have the challenge of modifying outdated technologies. Any pilot testing should be done by the County prior to tendering its final design to Ecology.

The estimated costs of this plant are too high for the County to proceed without having conducted the requisite alternatives study, including cost comparison. *See* 2006 Amendment, Ch. 9.7.1 at 9-12. According to the MBR-Network, energy costs for MBR plants are generally 30% to 50% higher, the membranes themselves (the most expensive unit cost in the 2006 Amendment - here over \$17 million) need to be replaced on a regular basis, and O&M costs are significantly higher due to the complexity of the technology and the potential for membrane fouling which necessitates more than routine maintenance.⁸

⁷ Lorenz, Wayne, P.E., Phosphorus Removal in a Membrane Reactor System: A Full-Scale Wastewater Demonstration Study (2002).

⁸ [See http://www.mbr-network.eu/mbr-projects/index.php](http://www.mbr-network.eu/mbr-projects/index.php)

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It may well be that MBR technology provides other benefits justifying its additional substantial costs. Or that these costs will decrease as the market grows. If so, the County should provide a clear analysis of the economic issues, not only because it is required to do so, but for the sake of transparency. County residents will be paying for this plant for years. Public decision makers need to understand the long-term commitment they are making on behalf of the public.

Without revising its initial selection criteria and reviewing current technologies and plants achieving low phosphorus levels, the County not only violated RCW 43.21C.030, but also failed to satisfy Ecology's technology selection protocol requirement as set forth in the Foundational Concepts document.

3. The Facility Plan Fails To Provide Adequate Alternatives To River Discharge Should Ecology Not Approve Its Delta Elimination Plan.

As explained above, the 2006 Amendment did not provide detailed loading analyses and plans for phosphorus reductions through water reclamation and reuse, conservation, or any other strategy but septic elimination. However, in recognition that Ecology might not approve its delta elimination plan, the County proffered the following back-up: "Spokane County may need to maximize flow to the RPWRF if 'delta' elimination actions are not approved and Spokane County cannot meet the target wasteload allocations in the *Foundational Concepts*." See 2006 Amendment Ch. 11.2.2 at 11-4. In essence, the County proposes to send all but 1.6 mgd of its new 8 mgd capacity to the City and to treat the 1.6 mgd to 50 ug/l. That means the City would receive an additional 6.4 mgd. This back-up plan is not an acceptable solution for several reasons.

First, if the County discharges even 1.6 mgd at 50 ug/l without a corresponding offset, it will cause or contribute to water quality violations. Such a discharge is prohibited.

Second, the County estimates that by 2011, its total average sanitary flow will be over 8.8 mgd. Amendment 2006 Ch. 2 Table 2-2, at 20-12. The plant design is for 8.0 mgd. Its current flow to the City is 6.6 mgd. Because there is no assimilative capacity in the river, there can be no additional loading or higher concentrations, whether by the City or County. See Water Quality Program Permit Writer's Manual at VI-36. The additional 6.4 mgd would constitute new loading to the City plant. Consequently, although a compliance schedule will apply to the City's existing loads, any increase in loading by the City, whether by the County or City, must meet final permit limits. If the County plans to increase its loading to the City plant, the City and County will need to determine which entity is responsible for offsets for that portion of the increase and then provide such offsets prior to increased loading. There is no indication that the City is willing or able to do this.

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Third, if the County sends an additional 6.4 mgd to the City, it will exceed its current 10 mgd capacity at the plant, leaving no room for peak flows from the County plant. Moreover, the County estimates that by the time the new plant is online, the combined flow to the City will be an average flow of 10 mgd, with peak flows of 22.1. *See* 2006 Amendment Ch. 9.3.1 Fig. 9-1 at 9-4. There is no assurance that the City will sign an interlocal agreement with the County to increase the County's flow to the plant or that it would have the capacity to do so given its own projected growth.

Because the 2006 Amendment, as drafted, lacks assurance that its effluent will meet the requisite water quality standards, it will not qualify for an NPDES permit.

4. Without An NPDES Permit, The Plant Cannot Obtain a 401 Certification, Section 404 Permit For The Outfall, or SRF Funding.

"Implementation of the project will require a number of permits and approvals from federal, state and local agencies." *See* 2006 Amendment, Ch. 10.7 at 10-5. These include an NPDES permit, a § 404 permit from the Corps for the outfall to the river, and a state § 401 certification of the Corps permit by Ecology.

a. Section 404 and 401 issues

The County's plan relies on discharge to the Spokane River through an outfall. *See* 2006 Amendment Ch. 3.6 at 3.6. In order to construct an outfall, the County must first obtain a § 404 permit from the Corps of Engineers, which in turn must receive a § 401 certification from Ecology. 33 U.S.C. § 1341; Ch. 173-225 WAC. The purpose of a § 401 certification is to ensure that a project requiring a federal permit is in full compliance with the salient provisions of the CWA and state law. A § 401 certification may not be issued if the proposed activity does not have the appropriate NPDES permit or will cause or contribute to violations of state water quality standards.

Without an offset plan that demonstrates reasonable assurance that the plant will meet the TMDL requirements, and without adequate peak flow planning,⁹ the County's facility plan does not provide sufficient assurances that it can meet the requirements of the TMDL or will not cause or contribute to water quality violations in contravention of the CWA. Thus, the County may not receive an NPDES permit, without which it cannot receive the § 404 permit or the § 401 certification.

⁹ *See infra* pp. 23-24.

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b. *SRF Funding*

Without these permits, the project is not eligible for an SRF loan, one of the primary funding mechanisms identified in the plan. "Spokane County and the Department of Ecology have developed an agreement for funding the recommended program that includes a loan from the State Revolving Fund (SRF) Loan Program. Under this program, Ecology provides up to 20-year loans to municipal agencies for water quality projects at interest rates that are generally lower than prevailing interest rates on municipal bonds." See 2006 Amendment Ch. 10.4.1 at 10-2.

Revised Code of Washington 90.50A.020 establishes the state water pollution control revolving fund which is a federally financed program. Under the federal regulations governing Clean Water Act grants and loans to states, *facility planning must be based on load allocations*, the applicant must comply with the requirements of all applicable environmental laws, regulations and executive orders, and EPA retains final approval authority. 40 C.F.R. § 35.917 (emphasis added). In addition, facility plans must include an evaluation of the capability of each alternative to meet applicable effluent limitations, an identification of NPDES effluent discharge limits, and discussions as to how the proposed project will result in compliance with these requirements. 40 C.F.R. § 35.917-1. Facilities plans submitted for approval must also include all necessary resolutions and interlocal agreements or assurances that these will be executed. 40 C.F.R. § 35.917-6. If the Regional Administrator determines that substantial changes have occurred in a facilities plan which warrant revision or amendment subsequent to submission, the plan shall be revised or amended and resubmitted for review. 40 C.F.R. § 35.917-9.

Chapter 173-98 WAC provides the regulations governing eligibility for state revolving loans. This chapter requires Ecology to approve the facilities plan, including site-specific planning documents, before an application for funding can be considered. WAC 173-98-060. Facilities plans approved by Ecology more than two years prior must contain evidence of recent department review to ensure the documents reflect current conditions. In addition, all recipients must comply with all applicable federal, state and local laws, orders, regulations and permits; applications must not be inconsistent with pertinent adopted water quality plans including, but not limited to, plans under sections 208, 303(e), 319 and 320 of the CWA, and, most importantly, facility plans must provide assurances that the necessary permits required by the authorities having jurisdiction over the project have been secured.

In its letter of August 2, 2004 revoking its initial approval of the County's wastewater facilities plan, Ecology offered the County a \$73,400,000 SRF loan with \$8.5 million for "updating the Wastewater Treatment Facility Plan to reflect requirements of the Spokane River total maximum daily load (TMDL) and subsequently to design and construct the new Spokane County regional

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wastewater-treatment plant per the approved and updated facility plan. The term of the loan is 20 years, with a 1.5 interest rate....” This offer came with a caveat: “We believe it is prudent to complete the TMDL and amend the facilities plan before proceeding with the design and construction of a new regional wastewater treatment facility.” See Exhibit 1.

This loan is in jeopardy unless the County’s new facilities plan is consistent with the waste load allocations in the TMDL.¹⁰ SRF funding proceeds through a step process- first, site-specific facilities plans, second, design, and then construction. WAC 173-98-060. Thus, merely because the County received funds for its design does not automatically guarantee funding for the subsequent steps. Clearly, Ecology and EPA intended for the County to update its plan consistent with federal and state law as a condition precedent to funding in excess of \$8.5 million. Indeed, to do otherwise would violate state and federal law.

The County had over two years and \$8.5 million to revise its facilities plan by either studying and choosing a technology that could treat to 10 ug/l, or developing detailed, scientifically defensible offset alternatives, including a feasible water reclamation and reuse plan, stringent pretreatment and other phosphorus limits and conservation ordinances. Instead, the County resubmits previous water reclamation and reuse, conservation and other phosphorus removal strategies recycled from its prior facilities plans. The County defers detailed planning and loading analyses to the future. See Amendment 2006 Ch. 11.2.3 at 11-4 (“In 2007, Spokane County will initiate development of a detailed Water Reclamation and Reuse Plan which will describe opportunities for reuse of reclaimed water and the associated phosphorus load reduction resulting from reuse. This to-be-determined load reduction will contribute to Spokane County’s overall ‘delta’ elimination”).

As to water conservation, implementation is largely left to the “discretion of the individual water purveyor.” See 2006 Amendment, Ch. 4.3 at 4-5 (“Adoption of a conservation plan is left to the discretion of the individual water purveyor”). Yet, the County admits that current groundwater pumping is approaching the natural supply of the aquifer and “may actually exceed the aquifer’s ability to meet demand” and that “no ‘new’ water may be available for consumptive use at some point in the future.” *Id.* at 2-18.

Given the urgent need to accommodate new growth in the region, the County’s failure to move forward over the past two and a half years with reuse and conservation plans is inexcusable and can only cause further delay, delay that may necessitate a moratorium on growth, something that few desire. Yet, from this plan, it would appear the County views delay as an opportunity to continue permitting yet more septic systems with

¹⁰ It is unclear whether or not the County utilized the entire \$8.5 million to revamp its facilities plan as the only salient changes appear to be the septic tank elimination technical memorandum and some additions to the MBR design including BNR and chemical additions. As noted, there were no in-depth analyses of other site-specific alternatives to discharge out of the river.

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corresponding offset potential. *See* 2006 Amendment, Ch. 2.4.3 at 2-11 (County estimates that approximately 800 septic systems will connect to the sanitary sewer per year from 2005 to 2011 and 916 per year from 2011 to 2015). This is unacceptable. The County should not be rewarded for its refusal to move forward expeditiously, especially where it had the opportunity and funding to do so.

The County should have used the intervening years to develop these alternatives to the level of specificity required by the regulations. Likewise, it should have conducted its septic elimination technical memorandum in time for peer review and further study as necessary. As such, the County has failed to provide reasonable assurance that it can meet effluent limitations through a combination of end-of-pipe reductions and other phosphorus reducing strategies.

c. Interlocal agreements

This plan does not include necessary interlocal agreements or provide assurances that these will be signed as required for SRF funding.

Although the County Commissioners have signed a resolution authorizing the County to execute a memorandum of agreement with the Department of Ecology, the City of Spokane, the City of Spokane Valley, and Liberty Lake Sewer and Water District formalizing the “Foundational Concepts for the Spokane River TMDL Managed Implementation Plan,” the parties have not yet executed this agreement. *See* Spokane County Resolution No. 6 0789 (September 19, 2006). Without a formal agreement with Ecology and the other dischargers, the County’s wasteload allocation is in doubt.

Second, as of this date, there is no interlocal agreement between the City of Spokane Valley and the County concerning wastewater management within Spokane Valley’s city limits. The facilities plan states only that the City of Spokane Valley has “indicated a preference” to have Spokane County provide wastewater management for the sewer service area within its city limits. *See* Amendment 2006, Chapter 1.1.5 at 1-4. Yet, there is no indication that an interlocal agreement is in the works or has been signed. An “indicated preference” is a far cry from assurance of a legally binding agreement.

Third, the plan does not provide assurances that an interlocal agreement has been signed with the City to provide capacity for the plant’s peak flows. The County’s plan does not call for redundant membranes for peak flow conditions. Instead, “the peak flow could be managed by offloading flow to the [City’s] plant....The interlocal agreement with the City should be reviewed to confirm hydraulic capacity owned by the County in the City sewer system.. Initial information indicates that the County owns 15.5 mgd of capacity (peak flow basis) in the City interceptor downstream from the SVI connection, and that there is no current restriction on the ratio of peak flow to average flow.” 2006 Amendment, Ch. 2.4.4 at 2-13.

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The City and County executed a Wastewater Management Agreement in December 1980, and four subsequent amendments thereto, in which the City agreed to reserve and the County agreed to purchase up to ten million gallons per day capacity in the regional wastewater treatment plant and interceptor system for the purpose of providing the County's wastewater treatment needs. See June 5, 2000 Facilitator Interlocal Agreement, available at <http://spokanecounty.org/commpub/ImageCntrl.aspx>. A review of these agreements indicates that there was never an agreement to provide treatment beyond 10 mgd.¹¹ See Exhibit 5.

If the County's assumption is incorrect, *this is a fatal flaw in the design plan and raises alarming questions as to whether the plant can meet redundancy and reliability requirements.* According to Washington State's criteria for sewage works design, unit operations in the main wastewater treatment system must be designed so that, with the largest flow capacity out of service, the hydraulic capacity of the remaining units is sufficient to handle the peak wastewater flow.¹²

As designed, the new County plant cannot handle peak flows, even with all units functional. Without adequate peaking capacity, the County's plant is unable to provide assurance that it can meet water quality standards and without an interlocal agreement providing the same, the County does not qualify for an SRF.¹³

5. Because There Are No Assurances That This Plant Can Meet Water Quality Standards At Start-Up, There Are No Assurances That It Will Not Violate Downstream Standards.

Under the CWA, tribes have the authority to establish NPDES programs in conjunction with EPA. EPA has the authority and obligation to require that upstream NPDES dischargers comply with downstream tribal standards. See 33 U.S.C. §§1311, 1341, 1342, 1377. See also *City of Albuquerque v. Browner*, 97 F.3rd 415 (10th Cir.). The Spokane Tribe's water quality standards for dissolved oxygen are currently violated at the boundary line. No NPDES permit may issue to a new upstream discharger that will cause or contribute to these violations.

¹¹ The 2002 Amendment appears to contradict the 2006 Amendment. "Initial information indicates that the County owns 15.5 mgd of capacity (peak flow basis) in the City interceptor downstream from the SVI connection, and that there is no current restriction on the ratio of peak flow to average flow." By contrast, the 2006 Amendment reads, "Through an interlocal agreement, Spokane County purchased capacity in the City's collection system to convey 10 mgd of County wastewater to the SAWTP. If the County needs to send wastewater flows in excess of its current capacity allowance, improvements to the City's collection system will be needed. However, the nature, cost and implementation of these improvements will be determined in part by the City's ongoing combined sewer overflow (CSP) planning effort." 2002 Amendment Ch. 2.6.1.

¹² See <http://www.ecy.wa.gov/pubs/9837/t3.pdf>.

¹³ The 2003 Amendment relied on the State's Criteria for Sewage Design for redundancy and design criteria. See 2003 Amendment Ch. 4 Table 4-5 at 4-13. By contrast, this plan appears to ignore these dictates.

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6. The 2006 Amendment Fails To Adequately Describe The Environmental Effects Of Its Discharge At Rebecca Street In Violation of RCW 43.21C.030.

By law, the County must include any adverse environmental effects from its proposed course of action and study, develop and describe appropriate alternatives. RCW 43.21C.030. This facilities plan recommends discharging effluent at the Rebecca Street outfall, based on the 2002 Supplemental Environmental Impact Statement. However, the plan fails to adequately analyze the potential environmental risks and alternatives. *See* 2006 Amendment, Ch. 3.6.1, p. 3-7; Ch. 6.6.8 at 6-23.

This outfall is in close proximity to City wells and, as noted in the 2003 Amendment, could potentially contaminate City wells and the Spokane-Rathdrum Aquifer. To mitigate potential contamination, the 2006 Amendment proposes chlorine disinfection rather than UV disinfection as initially proposed. This is problematic for several reasons.

First, siting a wastewater effluent pipe where it could contaminate our sole source aquifer or drinking wells appears unreasonable on its face.

Second, the 2006 amendment fails to provide any analysis as to whether chlorination is adequate mitigation.

Third, the plan does not analyze the environmental effects of residual chlorine in its effluent at that discharge site. In its 2003 Amendment, the County chose ultraviolet disinfection to “avoid issues with chlorine toxicity.” *See* 2003 Amendment Ch. 4 at 4-10. This amendment does not address chlorine toxicity.

Fourth, there is no recognition in any of these documents that the outfall is contiguous to Spokane Community College. There is no analysis as to how use of an outfall at this location will impact recreation on and along the river or area commercial and residential uses, especially during low water periods when dilution flows will be diminished. All one has to do is visit the river below the City’s plant in the summer to know that similar water quality and odors would be unacceptable in an urban setting. Moreover, the plan calls for a reduction in treatment outside the critical summer months. Unless the County provides assurance that there will be no degradation in aesthetics, both in odor and water quality, at any time of the year, this outfall should not be approved. *See* WAC 173-201A-260(2)(b)(Aesthetic values must not be impaired by the presence of materials or their effects, excluding those of natural origin, which offend the senses of sight, smell, touch, or taste).

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7. The Facility Plan Also Appears To Violate Regulations Governing Cost Structures For Federal Financial Participation Grants And Loans.

Under both state and federal law, cost-plus-percentage-of-cost and percentage-of-construction-cost contracts are prohibited. *See* 40 C.F.R. § 35.937-6; *see also* WAC 173-98-050(7)(d)(vii) (SRF loans for cost-plus percentage contracts or multiplier contracts prohibited). Here, the Contractor's overhead and profit is fixed at 10% of the unit process costs and engineering, administrative and legal costs are fixed at 25% of the total construction cost. *See* 2006 Amendment Ch. 9 Table 9-1 at 9-12. Without knowing more, these appear to be cost-plus contracts in violation of the above laws.

8. The 2006 Amendment Violates Ch. 173-240 By Failing To Provide Plans And Specifications With Requisite Specificity.

WAC Chapter 173-240 applies to all facility plans and requires that reports must be sufficiently complete so that plans and specifications can be developed from these without substantial changes. Here, by failing to provide sufficient information regarding redundancy and peaking capacity, alternatives to river discharge, and deferring selection of a biosolids management plan to the Design/Build/Operator, the County violated this provision. In addition, the failure to provide reasonable alternatives to these unresolved conflicts violates the Washington State Environmental Protection Act, RCW 43.20C.030(c)(iii)(e).

The cost estimates also omit estimates of the cost of other phosphorus reducing alternatives to septic tank elimination. Given the professional disagreements over loading from septic tanks and potential reductions, it is highly likely that this plant will need to rely on reclamation and reuse in order to comply with the water quality standards. Thus these strategies are integral rather than corollary to the plan. The County should have included cost estimates of these and other effective phosphorus reduction means. Without at least a reuse cost analysis, the estimated costs are necessarily grossly inadequate.

9. The 2006 Amendment Violates RCW 90.48.490 And RCW 43.20C.030 By Failing To Adequately Address Implementation Of Pretreatment Standards.

WAC Chapter 173-240 requires that facility plans meet the requirements of chapters 90.48 and 90.54 RCW pertaining to prevention and control of pollution in state waters. RCW 90.48.490 provides that plans for new sewage treatment facilities shall address implementation of pretreatment standards.

In this facility plan, the County recognizes that pretreatment requirements and internal recycling could reduce phosphorus loading to the County's plant, but fails to detail implementation plans. "As new industries locate in the service area, and as existing industries expand operations, the County should encourage them to aggressively pursue

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internal reuse and waste minimization programs.” (ES -12). Instead of providing data to support feasible phosphorus reductions from these sources, however, this plan recommends the status quo. “Since a pretreatment program is in place, no revisions are anticipated.” Ch. 4.5.1 at 4-16.

Generally speaking, after human wastes, industrial and commercial dischargers contribute the most phosphorus to the influent streams of wastewater treatment plants (WWTP). The contribution of phosphorus from these commercial and industrial sources accounts for approximately 46 percent of the non-ingested phosphorus load discharged into WWTPs. Reducing the commercial and industrial phosphorus contribution to WWTPs by one half would reduce the total non-ingested phosphorus discharged to WWTPs by almost 23 percent.¹⁴ Unfortunately, no similar data exists for Spokane River dischargers.

Numerous commercial, industrial, and institutional businesses utilize phosphorus for such activities as cleaning and sanitizing, metal preparation, finishing and painting, and food processing. Such enterprises include agricultural co-ops, car/truck washing facilities, dairies, food processing plants, meat packing and locker plants, metal finishing facilities, municipal water treatment plants that add phosphorus to drinking water, nursing homes, hospitals, research facilities, restaurants, and schools. Many of these, especially food processing plants, contribute a significant amount of CBOD as well.

Traditionally, industrial/commercial pretreatment programs focused on end-of-pipe solutions to control the discharge of industrial/commercial wastewater phosphorus, thus increasing the cost of wastewater treatment and requiring larger amounts of harsh treatment chemicals. Indeed, there are currently no pretreatment regulations, standards or requirements for phosphorus reductions from such businesses in the region.

Appropriate pretreatment programs designed to reduce phosphorus from these sources can reduce influent loadings of phosphorus and reduce influent water (hydraulic loading) thus avoiding the need to invest in additional sewer and treatment capacity, reducing chemical, energy and sludge management costs, reducing water demand, and increasing the life of existing water supplies.¹⁵ For example, the City of St. Cloud, Minnesota implemented a Phosphorus Management Plan that included strict pretreatment controls, biological treatment, modifications to city and local codes, and education and outreach to commercial businesses and residents. As a result, the City reduced the amount of phosphorus coming into its POTW by 32% and the amount of phosphorus leaving the facility by 48%.¹⁶

¹⁴ Minnesota Pollution Control Reports, available at <http://www.pca.state.mn.us/publications/reports/pstudy-section4.pdf>.

¹⁵ See Minnesota Technical Assistance Program, available at <http://mntap.umn.edu/POTW/index.htm>.

¹⁶ See <http://mntap.umn.edu/pmp/stcloud.htm>.

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Appropriately crafted pretreatment regulations can also benefit industry by enhancing environmental performance, reducing water consumption, lowering operating costs, and reducing regulatory burdens. For example, by implementing a phosphorus reduction program in its manufacturing process, Electrolux Home Products, a freezer manufacturer, dropped its phosphorus loading by 90%.¹⁷ Rochester Powder Coating, a job shop that paints sheet metal parts using powder coatings, reduced its phosphorus discharge by 98% over two years by using pollution prevention practices.¹⁸

The County has a legal duty to protect its plant from discharges of pollutants into the collection system by industrial/commercial users which may interfere with treatment processes, pass through to receiving waters, or contaminate WWTP sludge. The primary regulatory mechanism to control these pollutants is through pretreatment standards and requirements. 33 U.S.C. § 1317; Title 40 Chapter 403 C.F.R.; RCW 90.48.260; WAC 173-208-090, 173-216-150. Excise taxes and/or effluent strength charges may also reduce influent pollutants.

Both the City and the County of Spokane have pretreatment programs as conditions of their combined NPDES permit, but neither includes mandatory phosphorus control. In fact, it would appear that the County, through a 1996 interlocal agreement, contracted with the City to administer and implement its plan, as the City has been treating all County effluent.¹⁹ Unless the County can show that none of the influent to its new plant will be from industrial or commercial sources, the County must design, administer and implement its own program and it should do so in a fashion that reduces phosphorus influent to its plant.

As to businesses currently regulated under the County's program, the facilities plan failed to provide up-to-date information. According to the facility plan, ten businesses are currently regulated under its pretreatment program. *See* 2006 Amendment Ch. 4.5.3 Table 4-11 at 4-18. This was compiled from a 2001 list and is inconsistent with the Spokane County Annual Pretreatment Report of 2004 which listed seven businesses - Columbia Lighting, Kemiron, Mica Landfill, Novation, Honeywell Electronic Materials, Galaxy Compound Semiconductors, and Lloyd Industries.²⁰ The County should have provided current information on its pretreatment program.

In addition, given the need for the County to reduce phosphorus loading to its plant through alternatives other than or in addition to septic tank elimination, and the potential gain from commercial/industrial phosphorus reduction, the County should have done more than simply recycle its plan from the 2002 Amendment. The County should tender an analysis of current and future commercial/industrial loading and formulate a specific

¹⁷ See <http://mntap.umn.edu/POTW/electrolux.htm>.

¹⁸ See <http://www.p2pays.org/ref/04/03462.htm>. For more examples, see

<http://mntap.umn.edu/POTW/industrial.htm>

¹⁹ See Exhibit 5, Amendment No. 4 to Wastewater Management Agreement Between the City of Spokane and Spokane County (August 6, 1996).

²⁰ Spokane County Annual Pretreatment Report 2004 at 6 (March 30, 2005).

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reduction plan. This plan should identify feasible phosphorus reduction pretreatment strategies sufficient to provide assurances that the plant can meet the requirements of the TMDL.

Such a plan should include adequate funding for the pretreatment program to identify and regulate those non-domestic users who contribute phosphorus loading to the plant and to partner with Ecology to develop a public education program and technical assistance for businesses. It should also commit to enact ordinances amending pretreatment requirements and standards under the County sewer code to require all known, available and reasonable phosphorus removal and other pollution prevention measures by industrial/commercial users. Although the County may decide to create incentive programs to induce adoption of such pollution prevention strategies, it is the Legislature's intent that pretreatment costs be borne by industries. *See RCW 70.146.010.* Hence, the County needs to do more than hope for "voluntary" reduction activities by industries.

10. Other concerns:

- The 2003 Amendment relied on the State's Criteria for Sewage Design for redundancy and design criteria. *See* 2003 Amendment Ch. 4 Table 4-5 at 4-13. By contrast, this plan appears to ignore these dictates, especially as to redundancy and peak loading.
- The 2006 Amendment, Ch. 2.5.5, Table 2-8 at 2-23, states "Compliance with effluent phosphorus limits should be determined on a monthly median basis in recognition of variability in treatment performance when achieving very low effluent phosphorus concentrations."

We disagree and believe that phosphorus effluent limitations in NPDES permits should be determined on an average monthly basis rather than the median. The regulations allow for mass concentration limits on an average or monthly basis, or other appropriate limitation. WAC 173-220-130(3)(b). Given that some type of averaging of effluent concentration is reasonable, the question then becomes the type of averaging and the averaging period that is the most relevant for phosphorus limits. During the TMDL Collaboration Technology Workshop in October 2005, the County and other dischargers suggested that seasonal or 30-day medians were appropriate. The Sierra Club, based on analysis by its expert, Dr. Joel Massman, strongly disagrees.²¹ The median effluent concentration is not the correct metric and if averaging is allowed, the mean should be used instead of the median. In addition, the relevant averaging period is probably monthly. According to Dr. Massman:

The median is the number in the middle of a set of numbers, that is, half the numbers have values that are greater than the median

²¹ Dr. Massman's Technical Memorandum and resume are attached as Exhibit 6.

and half have values that are less. This is not a particularly relevant number in terms of the phosphorus load to a river system, as illustrated in the example on Table 1. Table 1 lists two sets of numbers that might represent the effluent concentrations during a 30-day period for two different treatment technologies – “A” and “B.” These treatment technologies result in the same median concentration (100ug/l), but have very different mean values and total loads to the system.

Technology “A” has a mean concentration of 100 ug/l and a total load for the month of 1625 pounds of phosphorus, while Technology “B” has a mean concentration of 200 ug/l and a total load of 3350 pounds of phosphorus. These two effluent streams have the same median effluent, 100 ug/l, but they may result in dramatically different impacts in terms of water quality. The median phosphorus effluent, then, is not a relevant number and should not be used to define a treatment standard if the true objective is to control the phosphorus load on the system.

Water quality impacts related to algae in the Spokane River and Long Lake System occur over three general time scales: days, weeks and months. The shortest-time scale is the daily fluctuations or “swings” that occur during a 24-hour period due to photosynthesis and respiration. Although the magnitude of the swing is affected to some degree by the rate of algae growth (which is in turn affected by the phosphorus load), this effect is secondary to other effects such as light, temperature, and average algae concentration.

The second time scale relates to the change in the algae concentration or population in the system. This change occurs on the order of weeks. The third time scale relates to the affect of the algae on the sediment oxygen demand. This occurs over time scales on the order of months to years.

In terms of phosphorus loading, the second scale (weeks) is probably most important. If algae concentrations are kept low, then the daily swings will not be important and the sediment oxygen demand will eventually be reduced. If algae concentrations respond to phosphorus load over time periods of approximately a week to a month, then this would be the relevant averaging period. The mean, however, underestimates the loading and should not be used.

Exhibit 6.

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- Phosphorus is not the only pollutant driving low dissolved oxygen levels. “Direct loading of BOD from point and nonpoint sources also decreases dissolved oxygen concentrations.” Draft DO TMDL, at 10 (October 2004). Thus, reductions in both BOD and nutrients are necessary to mitigate the impacts of these pollutants on dissolved oxygen. *Id.* The 2006 Amendment proposes permit limits with average monthly concentrations of CBOD of 25 mg/l and 40 weekly concentration of 20 mg/l. *See* 2006 Amendment, Ch. 2.5.5, Table 2-8 at 2-23. The City’s monthly average permit limit is currently 30 mg/l and, in 2004, its monthly average was only 5.6 mg/l. TMDL at 15. Given that BOD concentrations will necessarily have to come down, these proposed permit limits must be revisited in conformity with TMDL loading requirements and “no backsliding” requirements.
- The 2006 Amendment states that the Spokane River is also critically impaired for persistent bioaccumulative toxins including PCBs, PBDEs, and dioxins and furans. The amendment states that treatment processes such as MBR and membrane filtration “are expected” to increase PCB removal and that chemical addition “will likely increase removal as well.” *See* 2006 Amendment, Ch. 2.6.1 at 2-27. The County will be required to control PCBs in its effluent when the PCB TMDL is implemented. TMDLs for the other toxins will be coming as well. Because the County is building a new plant, it is irresponsible not to study and develop alternatives to toxin removal PRIOR to investing in this plant.
- This plan defers to a yet-to-be-selected DBO contractor to develop a biosolids management plan. The County also defers the decision as to who will be responsible for the biosolids management system, the “County alone or by the City and County together.” *See* 2006 Amendment, Ch. 3.7 at 3-7. As a major capital component of the County’s plan, the biosolids management plan must be detailed with specificity to allow public review prior to submission to Ecology.
- Here the County presents three alternatives for discharge – 1) advanced treatment to under 10 ug/l with delta offsets; 2) secondary treatment with discharge to the Spokane River and land application during the critical months, or 3) advanced treatment with no river discharge but instead reuse, recharge, and wetlands application and/or discharge to the river as appropriate. “At present, Spokane County’s preference is” is river discharge with offsets. *See* 2006 Amendment, Ch. 3.8 at 3-9. A “preference” does not substitute for a detailed study of alternatives. Given the inherent uncertainties surrounding demonstrable offsets, the County’s “preference” should be revisited in a manner that comports with SEPA and the regulations governing facilities planning.

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In sum, Ecology should not approve this plan until it has been amended to provide assurances that the plant as designed is adequate to protect the quality of the state's waters as required by Ch. 90.48 RCW. RCW 90.48.110(1).

During a final meeting of the TMDL Collaboration, Commissioner Todd Mielke informed the audience that the County intends to build one of the best reclamation/reuse plants in the nation. We support that effort and look forward to reviewing a facilities plan that provides the details.

We appreciate your consideration of our comments.

Sincerely,

CENTER FOR JUSTICE



Bonne Beavers

Attorney at Law

On behalf of the Sierra Club, Upper Columbia Group

cc: Todd Mielke, Bonne Mager, Mark Richards
Spokane County Board of Commissioners

Jay Manning, Dave Peeler, Grant Pfeiffer, Ron Lavigne, Jim Bellatty
Washington Dept. of Ecology

Tom Eaton, Adrienne Allen
Environmental Protection Agency Region 10

Michael DeVleming, Mayor City of Spokane Valley

Dale Arnold, City of Spokane, Wastewater Management Director

Enclosures

BB:meh

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EXHIBITS

- Exhibit 1 - August 2, 2004 Letter from Ecology to Bruce Rawls
August 18, 2004 Letter from Ecology to Sierra Club
- Exhibit 2 - Letter from Sierra Club to Dave Peeler re: Foundational Concepts
- Exhibit 3 - Gary Andres, Technical Memorandum, Review of HDR Phosphorus Loading Estimate Technical Memorandum, June 27, 2006.
- Exhibit 3.1 - Gary Andres, Technical Memorandum, Review of HDR Phosphorus Loading Estimate Technical Memorandum, January 15, 2007.
- Exhibit 4 - Gary Andres' Resume
- Exhibit 5 - City/County Interlocal Agreements
- Exhibit 6 - Dr. Joel Massman Technical Memorandum with Table 1 and resume.

Exhibits that accompany this letter are on file at Spokane County.

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**Spokane County Response to Comment Letter from the Center for Justice, dated February 7, 2007
Regarding the Draft Spokane County 2006 Wastewater Facilities Plan Amendment
(hereinafter referred to as the Draft 2006 Amendment)**

- 1. “The 2006 Amendment Fails to Provide Assurances That The County’s Discharge will Achieve Compliance With The TMDL’s 10 ug/L Phosphorus Limits.”**

The Draft 2006 Amendment provides a plan for meeting the phosphorus targets specified in the “Foundational Concepts for the Spokane River TMDL Managed Implementation Plan”, issued June 30, 2006, and formally approved by Ecology February 2007. Chapters 6 and 7 of the Draft 2006 Amendment contain detailed information about All Known And Reasonable Technology (AKART) and a Phosphorus Management Plan is presented in Chapter 11, which provides assurance of compliance with the 10 ug/L target contained in the Foundational Concepts document.

- 2. “The County Failed To Adequately Study and Assess All Reasonable Treatment Alternatives to Phosphorus Removing Wastewater Technology And, In So Doing, Failed To Provide A Comprehensive Technology Selection Protocol For Choosing The Most Effective Feasible Technology For Seasonally Removing Phosphorus From Its Effluent.”**

The Draft 2006 Amendment, along with previous facilities planning documents, defines the water quality standards that must be met for discharge of effluent into the Spokane River, characterizes the wastewater stream to be treated, evaluates proven wastewater treatment technologies, and recommends the best treatment technology for meeting the water quality standards, including phosphorus. For the past three decades, a facilities plan that includes the above referenced considerations, and which meets the requirements of WAC 173-240, has been the standard in the industry for “Technology Selection Protocol”.

- 3. “The Facility Plan Fails To Provide Adequate Alternatives To River Discharge Should Ecology Not Approve Its Delta Elimination Plan.”**

The Draft 2006 Amendment is consistent with the Foundational Concepts document, which contemplates a discharge from the new Spokane County Regional Water Reclamation Facility, and provides a wasteload allocation for said discharge.

- 4. “Without An NPDES Permit, The Plant Cannot Obtain a 401 Certification, Section 404 Permit For the Outfall, or SRF Funding.”**

Comment noted. An NPDES permit is not a prerequisite for obtaining a Section 401 water quality certification, or a section 404 permit.

5. "Because There Are No Assurances That This Plant Can Meet Water Quality Standards At Startup, There Are No Assurances That It Will Not Violate Downstream Standards."

The Draft 2006 Amendment demonstrates that the new facility will conform to the requirements of the Foundational Concepts document, and to other applicable water quality standards.

6. "The 2006 Amendment Fails To Adequately Describe The Environmental Effects Of Its Discharge At Rebecca Street In Violation of RCW 43.21C.030."

In compliance with Washington State Law, Spokane County has issued final documents in accordance with SEPA, as follows:

- Spokane County Wastewater Facilities Plan Final EIS, February 6, 2002
- Spokane County Regional Wastewater Treatment Plant Final Supplemental Environmental Impact Statement, December 6, 2002
- Addendum to the Final Supplemental Environmental Impact Statement, December 18, 2006
- Notice of Action, Spokane County 2006 Wastewater Facilities Plan Amendment, December 20, 2006

7. "The Facility Plan Also Appears To Violate Regulations Governing Cost Structures For Federal Financial Participation Grants And Loans."

Comment noted.

8. "The 2006 Amendment Violates Ch. 173-240 By Failing to Provide Plans and Specifications With Requisite Specificity."

Ch. 173-240 does not require submission of an Engineering Report, or Plans and Specifications as a part of a wastewater facilities plan. Spokane County will conform to state laws and administrative code by submitting all appropriate documents following review and approval of a wastewater facilities plan by Ecology.

9. "The 2006 Amendment Violates RCW 90.48.490 and RCW 43.20C.030 By Failing To Adequately Address Implementation Of Pretreatment Standards."

Spokane County, as a co-permittee with the City of Spokane on the NPDES permit for the Riverside Park Water Reclamation Facility, has an approved Industrial Pretreatment Program, as required by the permit. Inclusion in the Draft 2006 Amendment would be redundant.

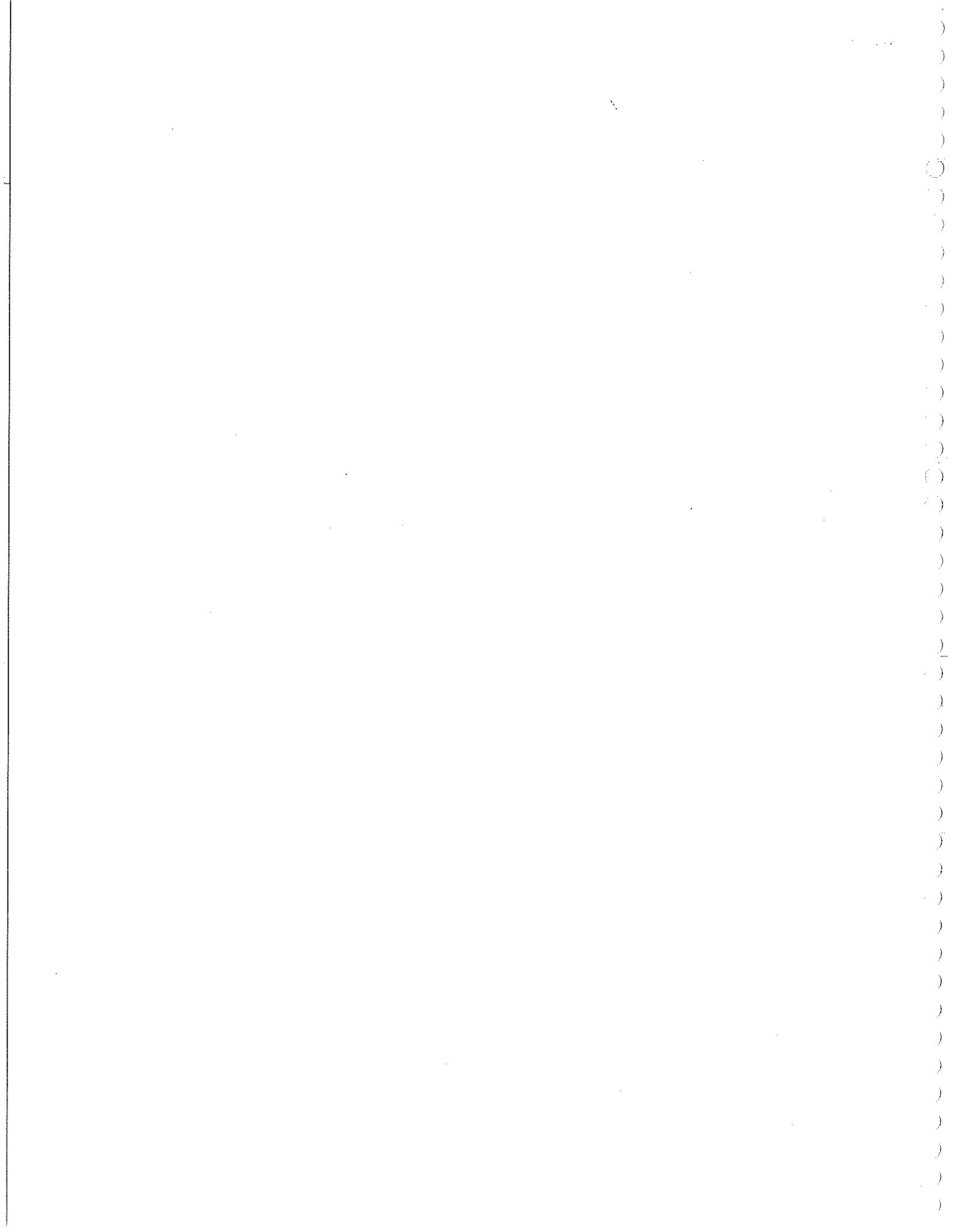
10. “Other Concerns:”

The following bullets provide a response to the other concerns outlined in bullet format at the end of the Center for Justice comment letter:

- The Spokane County Wastewater Facilities Plan is comprised of the following documents, which are complementary to each other:
 - Spokane County Wastewater Facilities Plan, Issued as Final December 2002, Approved by Ecology
 - Spokane County Wastewater Facilities Plan Amendment, Issued as Final February 2002, Approved by Ecology
 - Draft Spokane County 2006 Wastewater Facilities Plan Amendment, issued as draft December 2006

The contents of earlier approved documents are not repeated in their entirety in the Draft 2006 Amendment. The Draft 2006 Amendment provides new or additional information where necessary to meet the requirements of the Foundational Concepts document.

- Spokane County continues to assert its position regarding compliance limits for the new facility.
- The Draft 2006 Amendment is for a new facility, not the existing City of Spokane facility, hence backsliding is not relevant for a new facility. The discharge limits for the new facility will address constituents as necessary to meet the current water quality standards and the Spokane River Dissolved Oxygen TMDL.
- Comment noted.
- Spokane County will retain responsibility for management and disposal of biosolids, and will develop a Biosolids Management Plan in accordance with all applicable state and federal requirements.
- The Draft 2006 Amendment presents a plan that includes discharge to the Spokane River, along with alternative disposal methods, and meets the requirements for facilities planning and the Washington State Environmental Policy Act.





PUBLIC WORKS & UTILITIES
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October 2, 2006

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SPOKANE COUNTY UTILITIES

Mr. Bruce Rawls
Utilities Director
Spokane County Utilities, PWK-4
1116 W. Broadway Ave.
Spokane, WA 99260-0430

RE: Follow-up on Proposed WWTP outfall at Rebecca St. location

Dear Mr. Rawls:

This letter is written to list conditions that if satisfied would facilitate City acceptance of the County's proposed wastewater outfall at Rebecca Street on the Spokane River. This location being such that some portion of water there has the potential of reaching City drinking water wells in less than a year's travel time.

With your assistance, and at County expense, we have been informed of the steps you will take to identify and reduce risk to the wells. You will find that a number of the conditions below are consistent with items the County planned to do.

First, in the areas currently under discussion (Stockyards site with Rebecca or Trent discharge alignment), with the currently proposed treatment processes (high level of treatment but not consistently Class A reclaimed water), a river discharge is most appropriate and least risky as regards aquifer and drinking water quality. We must restate our belief that the only way to avoid some added risk to City wells is to move the discharge point downstream near or below the existing old Trent Avenue bridge.

The County has identified cost and environmental concerns with moving the proposed discharge point, and while not agreeing to move the discharge point, has indicated intent of doing what is possible to avoid added risk to City wells. In particular, County staff and consultants have made a number of assurances which we feel are key to agreement with the discharge point at Rebecca. These assurances should be publicly acknowledged as design and operational benchmarks in moving the project forward and permitting its operation with an outfall at Rebecca. These form the basis of conditions 1 through 4, and in addition we reiterate two previously stated conditions:

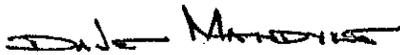
- 1) The membrane filtering system will be designed and operated such that no amount of unfiltered wastewater will be discharged to the river, even under plant upset conditions.

Mr. Bruce Rawls
Spokane County Utilities
October 2, 2006
Page 2

- 2) The membrane filtering system will be designed and operated such that protozoal disease causing organisms cannot pass the filter, and are never discharged to the river.
- 3) The effluent will be treated with hypochlorite such that viral inactivation will be assured.
- 4) Other chemical parameters as measured at the wells will not increase, as the combination of wastewater plant level of treatment and removals of septic systems result in no worse than the status quo.
- 5) Since some potential additional risk had been identified, and to demonstrate compliance with above conditions, the City will be given copies of all Wastewater Treatment Plant effluent and river monitoring results done by or for the proposed facility.
- 6) Finally, we restate our expectation that the City of Spokane Water Department will be compensated by Spokane County for all costs associated with addressing actual risks posed by the facility.

Should you have any questions please contact me at 625-6320 or
dmandyke@spokanecity.org.

Sincerely,



Dave Mandyske
Acting Director

cc: Jack Lynch, Deputy Mayor
Dale Arnold, Director, Wastewater Management
Brad Blegen, Director, Water and Hydroelectric
Lloyd Brewer, Program Manager, Environmental Programs