

11.1 INTRODUCTION

The *Foundational Concepts for the Spokane River TMDL Managed Implementation Plan (Foundational Concepts)* describes the wasteload allocations for dischargers to meet the requirements of the TMDL. The wasteload allocation for Spokane County is based upon an annual average influent flow rate of 8 mgd and sets a target of 10 µg/L effluent phosphorus concentration (0.67 lbs/day phosphorus). The *Foundational Concepts* document acknowledges the limited capability of reliable 8 mgd treatment technology to consistently achieve 10 µg/L effluent phosphorus and authorizes the County to develop a “delta elimination plan” to identify target pursuit actions to bridge the gap between the 10 µg/L target and the treatment technology capabilities.

Spokane County has prepared a delta elimination plan (Phosphorus Management Plan) for approval by the Washington State Department of Ecology (Ecology), along with a schedule for other phosphorus removal actions. Potential other phosphorus removal actions include conservation, effluent re-use, source control through support of regional phosphorus reduction efforts (such as limiting use of fertilizers and dishwasher detergents which contain phosphorus), and supporting regional non-point source control efforts yet to be established. The Phosphorus Management Plan, in combination with the phosphorus reduction from treatment technology, provides reasonable assurance of meeting Spokane County’s phosphorus loading target when the new Spokane County Regional Water Reclamation Facility (SCRWRF) begins operation. This Phosphorus Management Plan, which is contained in the *2007 Wastewater Facilities Plan Amendment* is Spokane County’s Delta Elimination Plan for the purposes of meeting the requirements of the *Foundational Concepts*. This Phosphorus Management Plan defines the phosphorus management actions for which Spokane County has committed to implement to provide reasonable assurance of meeting targets.

11.2 TARGET PURSUIT ACTIONS

Foundational Concepts defines several “target pursuit actions” which include a combination of both treatment technology and “delta” elimination efforts to reduce Spokane County’s phosphorus load to the Spokane River. These target pursuit actions include both required and elective (available) actions. For a complete description of each target pursuit action, see the *Foundational Concepts* document in Appendix A of this *2007 Wastewater Facilities Plan Amendment*.

Several of the required and available target pursuit actions defined in the *Foundational Concepts* document are activities to be led by Ecology. Other target pursuit actions can be led by Spokane County directly. The target pursuit actions that directly reduce the phosphorus loading to the Spokane River are included in this Spokane County Phosphorus Management Plan. These actions include water conservation, production of Class A effluent, reclaimed water and reuse, regional phosphorus reduction programs, source control programs, regional non-point source reduction programs, and septic tank elimination.

Table 11-1 lists all of the target pursuit actions identified in *Foundational Concepts* and categorizes each target pursuit action as an action being led by Spokane County, an action in which Spokane County plans to participate, or an action to be led by Ecology. Also, not all

of the target pursuit actions defined in *Foundational Concepts* will directly result in “delta” elimination. For example, an “expeditious decision” by Ecology or an “Engineering Report” by Spokane County will not directly result in phosphorus load reduction. For this reason, Table 11-1 also identifies which actions Spokane County may consider for possible actions for “delta” elimination. These actions are briefly described in this chapter.

Table 11-1. Spokane County “Target Pursuit Actions” from the “Foundational Concepts for the Spokane River TMDL Managed Implementation Plan”

Target Pursuit Action	Ecology Led Pursuit Action	Spokane County Participating Pursuit Action	Spokane County Led Pursuit Action	Actions for “Delta” Elimination
Required Action¹				
Technology Selection Protocol			X	
“Delta” Elimination Plan			X	
Expeditious Decision	X			
Engineering Report			X	
Interim Limits	X			
Final Limits	X			
Investment Stability	X			
Conservation			X	X
Class A Effluent			X	X
Available Actions²				
Reclaimed Water			X	X
Regional Phosphorus Reduction Programs		X		X
Bio-Available Phosphorus		X		
Source Control Programs			X	X
Regional Non-Point Source Reduction Programs	X	X		X
Septic Tank Elimination Program			X	X

¹ *Foundational Concepts* defines “Required Actions” as target pursuit actions for each NPDES permit holder with a “Delta”.

² *Foundational Concepts* defines “Available Actions” that are not required of every NPDES permit holder with a “Delta” and notes that the regional non-point source reduction program needs to have sufficient participation to achieve the TMDL-related phosphorus reduction.

11.2.1 Septic Tank Elimination Program

Spokane County Division of Utilities records show that sewer service has been provided to approximately 7,186 onsite sewage disposal systems within the Spokane County service area from 2001 through 2005, and the Utilities Division estimates that service will be provided to 800 onsite sewage disposal systems per year up to the year 2011. Once the SCRWF is completed, sewer service will be provided to the remaining systems within the service area between 2011 and 2015.

The total annual phosphorus load reduction to the Spokane River from the Spokane County Septic Tank Elimination Program was estimated in a technical memorandum in Appendix B

of this *2007 Wastewater Facilities Plan Amendment*. The range in annual total phosphorus load reduction to the Spokane River is summarized in Table 11-2. The TMDL load allocation was based on the year 2001, so the annual total phosphorus load reduction resulting from providing sewer service to onsite sewage disposal systems begins in 2001. By removing septic systems between 2001 and 2005, the estimated phosphorus load reduction to the Spokane River is currently between 3.8 lbs/day and 6.3 lbs/day. The lower range of annual total phosphorus load reduction to the Spokane River in 2015 is estimated to be 4,440 lbs (12.2 lbs/day). The upper range of annual total phosphorus load reduction to the Spokane River in 2015 is estimated to be 7,400 lbs (20.3 lbs/day).

Table 11-2. Phosphorus Load Reduction to the Spokane River Resulting from Sewer Connections of Septic Systems

Year	Estimated Number of Systems with Breakthrough	Loading to Ground Water (lbs/day)	Loading to Surface Water, lbs/day	
			Retention Factor 0.5	Retention Factor 0.7
2001-2005	630 ^a	12.6	6.3	3.8
2005-2015 ^b	1,461	28.0	14.0	8.4
TOTAL	2,091	40.6	20.3	12.2

^a Based on Spokane County records for number of existing structures provided sewer service between 2001 and 2005.

^b Future P loading to be removed from the Spokane River system once sewer service is provided to existing onsite sewage disposal systems.

11.2.2 Treatment Technology

The sewage in Spokane County's wastewater collection system will be conveyed to one of two wastewater treatment facilities. Sewage flows from the North Spokane Interceptor are conveyed to the Riverside Park Water Reclamation Facility. Spokane County plans to operate the SCRWRF at 8 mgd annual average flow and convey only flows from the Spokane Valley service area to it. As flows increase in the North Valley Interceptor and Spokane Valley Interceptor above 8 mgd annual average flow, greater flow could be conveyed to the Riverside Park Water Reclamation Facility, up to a maximum of 10 mgd.

Advances in treatment technology could increase reductions in phosphorus discharged from the SCRWRF. If effluent phosphorus is reduced from 50 µg/L to 10 µg/L for an 8 mgd annual average flow, the reduction in effluent phosphorus would amount to 2.67 lbs/day. This phosphorus load is entered into Table 11-9 to illustrate the potential for reduction from advances in treatment technology.

If necessary, Spokane County could operate the SCRWRF at a reduced flow rate (less than 8 mgd annual average flow) and continue to convey up to 10 mgd of raw wastewater to the City of Spokane Riverside Park Water Reclamation Facility. Operation of the SCRWRF at less than the design capacity of 8 mgd, and perhaps as low as 1.6 mgd, may be considered if phosphorus reduction credits to satisfy the "delta" were not available when the facility is commissioned, or not considered to be concurrent with the provision of sewer service.

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 *Foundational Concepts*. The target phosphorus load for Spokane County in 2017 is 0.67 lbs/day. The new SCRWRF could be operated at 1.6 mgd and effluent phosphorus

concentration of 50 µg/L for a phosphorus load of 0.67 lbs/day. The remaining 6.4 mgd would continue to be conveyed to the RPWRF. If Spokane County's delta elimination actions are not approved, Spokane County would be restricted to operating the new, state-of-the-art wastewater reclamation facility at a reduced flow and water quality in the Spokane River would not benefit from the high level of advanced treatment in the County's new treatment facility.

11.2.3 Other Target Pursuit Actions

The delta elimination that results from the County's Septic Tank Elimination Program alone will provide Spokane County with a surplus of phosphorus reduction credits. Spokane County has other options available to develop additional phosphorus reduction credits. These other actions include water conservation, water reclamation and reuse, regional phosphorus reduction programs with other agencies, quantification of bio-available phosphorus, source control programs, regional non-point source reduction programs, and stormwater management programs.

Water Conservation

Water conservation has environmental benefits that extend beyond phosphorus load reduction to the Spokane River. By minimizing withdrawals from the aquifer, more water is available for other beneficial uses. Less energy is required for supplying water for consumptive uses because less water is in demand. Also, less energy is required for treating wastewater after it has been used and conveyed to the County's wastewater system.

However, water conservation may have a few negative impacts on wastewater management. Conservation will decrease the wastewater quantity, but may not reduce the mass of wastewater solids and organics entering the treatment plant. As a consequence, wastewater biochemical oxygen demand and total suspended solids concentrations may increase. Conveyance transport time may be increased. The higher strength and extended transport time may work to increase the potential for odor and corrosion in the collection system.

Nonetheless, water conservation will reduce flow to the SCRWRF, which in turn will reduce the flow to the Spokane River. If the effluent phosphorus concentrations remain constant, the P loading to the river will be reduced.

Plumbing code enforcement may reduce sewage flows by over 10 percent in 20 years, related to replacement of toilets and showerheads. Table 11-3 is an estimate of the total phosphorus reduction, starting in 2010, if plumbing code enforcement reduces wastewater generated by 10 percent over 20 years. This is based on total Spokane County wastewater flows (including the North Spokane area) from 8.9 mgd in 2010 to 19.2 mgd in 2030 and an effluent phosphorus concentration of 0.05 mg/L.

Table 11-3. Phosphorus Load Reduction through Plumbing Code Enforcement

Year	Total Average Annual Wastewater Flow, mgd ¹	Percent Reduction through Plumbing Code Enforcement	Phosphorus Load Reduction, lbs/day
2010	8.9	0%	0
2015	11.2	2.5%	0.117
2020	13.9	5.0%	0.290
2025	16.5	7.5%	0.516
2030	19.2	10.0%	0.801

¹ Assumes total Spokane County wastewater flow from both North Spokane service area and SCRWRF service area.

New commercial buildings, including schools, industrial offices, hotels, offices, fire stations, and hospitals, may provide some of the greatest opportunity for implementing water conservation measures. By requiring Leadership in Energy and Environmental Design (LEED) water conservation measures to be installed in every new non-residential building, wastewater flow may be reduced by approximately 28 percent in these buildings versus conventional building construction.

Water Reclamation and Reuse

In 2007, Spokane County initiated the development of a detailed Reclaimed Water Use Study which describes opportunities for reuse of reclaimed water and the associated phosphorus load reduction resulting from reuse. The phosphorus load reduction from reuse will contribute to Spokane County's overall "delta" elimination plan.

The Spokane County Regional Water Reclamation Facility site is one location where reclaimed effluent will be reused for outdoor irrigation. The Effluent End Use Alternatives chapter of the *2002 Wastewater Facilities Plan* described several potential locations for urban irrigation using reclaimed water. These potential locations have been screened in the pending Reclaimed Water Use Study to include Plantes Ferry Park, the Spokane County Fair and Expo Center, and the Painted Hills Golf Course. Spokane County is also discussing irrigation of the Esmerelda Golf Course with the City of Spokane given its relatively close proximity to the SCRWRF. Table 11-4 shows these potential locations for irrigation with reclaimed water, the irrigation water requirement, and the resulting phosphorus load reduction to the Spokane River.

Table 11-4. Monthly Water Demand and Phosphorus Load Reduction through Irrigation with Reclaimed Water

Month	Esmerelda Golf Course (162 acres) ¹		Painted Hills Golf Course (87 acres) ¹		Plantes Ferry Park (90 acres) ¹		Spokane County Fair and Expo Center (15 acres) ¹		SCRWRF Site (9 acres) ¹		Total (363 acres)	
	Q ²	P ³	Q	P	Q	P	Q	P	Q	P		
May (15-31)	263,000	0.109	146,000	0.061	146,000	0.061	24,000	0.010	14,600	0.006	593,000	0.247
June	847,000	0.353	471,000	0.196	471,000	0.196	78,000	0.033	47,000	0.020	1,915,000	0.798
July	1,260,000	0.525	700,000	0.292	700,000	0.292	117,000	0.049	70,000	0.029	2,847,000	1.187
August	1,009,000	0.421	560,000	0.234	560,000	0.234	93,000	0.039	56,000	0.023	2,279,000	0.950
September	638,000	0.266	354,000	0.148	354,000	0.148	59,000	0.025	35,400	0.015	1,441,000	0.601
October (1-10)	157,000	0.066	87,000	0.036	87,000	0.036	15,000	0.006	8,700	0.004	355,000	0.148
SEASONAL AVERAGE	815,000	0.340	453,000	0.189	453,000	0.189	75,000	0.031	45,300	0.019	1,842,000	0.768

¹ Areas are irrigated acres.

² Q is the average monthly irrigation demand, stated in gpd.

³ P is the resulting phosphorus load removed from the Spokane River based on the average irrigation demand and 0.05 mg/L phosphorus concentration, stated in pounds per day.

An estimated phosphorus reduction to the Spokane River resulting from an increase in irrigation with reclaimed water in future years is presented in Table 11-5. This assumes that 100 acres of irrigable area could be added to the Spokane County reclaimed water use program every year and the total irrigation demand for a 148 day season is 28.22 inches (518,000 gpd/100 acres). The flow for reclaimed water use reduces the flow to the Spokane River discharge, and the phosphorus loading to the Spokane River is reduced by 0.05 mg/L multiplied by the rate of water reuse.

Table 11-5. Phosphorus Load Reduction through Reclaimed Water Irrigation

Year	Irrigable Acres for Reclaimed Water Use, acres	Average Flow for Reclaimed Water Irrigation, mgd	Phosphorus Load Reduction, lbs/day
2010 ¹	363	1.84	0.768
2015	500	2.59	1.08
2020	1,000	5.18	2.16
2025	1,500	7.77	3.24
2030	2,000	10.36	4.32

¹ Assumes initially available reuse sites are identified in Table 11-4 Esmerelda Golf Course, Painted Hills Golf Course, Plantess Ferry Park, Fair and Expo, and the SCRWRP site.

Regional Phosphorus Reduction Programs

This target pursuit action was included in *Foundational Concepts* to provide for a means among multiple permit holders to collaborate on regional phosphorus reduction activities accomplished jointly. Possible phosphorus reduction activities could include effluent reuse with effluent combined from more than one discharger; reuse of municipal effluent for non-potable, industrial activities; and partnerships in public education and outreach programs for water conservation and phosphorus reduction.

Spokane County is working toward collaborative efforts with other dischargers and future phosphorus load reductions resulting from future collaboration will be documented.

Bio-Available Phosphorus

Foundational Concepts describes quantification of bio-available phosphorus as an available action for addressing the "delta" between treatment technology and phosphorus reduction goals. Wastewater treatment facilities that produce effluent with extremely low phosphorus concentrations may remove bio-available phosphorus and the remaining phosphorus that is discharged may not be bio-available. If so, *Foundational Concepts* suggests that Ecology will give credit for the amount of phosphorus remaining as long as it is demonstrated to not be bio-available.

Recent testing of phosphorus speciation in other communities in the region suggests that the soluble, nonreactive phosphorus concentration in municipal wastewater is between 0.010 mg/L and 0.015 mg/L. The load to the Spokane River from soluble, nonreactive phosphorus for the total projected flows from the entire Spokane County service area is shown in Table 11-6.

Table 11-6. Phosphorus Load Reduction by Accounting for Soluble, Nonreactive Phosphorus

Year	Total Average Annual Wastewater Flow, mgd	Estimated Concentration of Soluble, Nonreactive Phosphorus, mg/L ¹	Phosphorus Load Reduction, lbs/day
2010	8.9	0.01	0.742
2015	11.2	0.01	0.934
2020	13.9	0.01	1.16
2025	16.5	0.01	1.38
2030	19.2	0.01	1.60

¹ Estimated concentration of soluble nonreactive phosphorus is based on recent pilot studies for four treatment technologies in the Spokane River watershed.

Source Control Programs

Source control programs target phosphorus reduction in wastewater, so there is less phosphorus that must be removed through biological, physical/chemical, and mechanical treatment.

One example of phosphorus reduction through source control is the State of Washington statewide phosphate dishwashing detergent ban. This ban has now been signed by the Governor and will take effect first in Spokane County, Clark County, and Whatcom County by 2008 and statewide by 2010. Spokane County Commissioner Todd Meilke was instrumental in bringing the phosphate dishwashing detergent ban to the legislature during the TMDL collaboration process.

Recent studies indicate that each dishwasher generates wastewater phosphorus of 10.2 grams/week (Hanrahan and Winslow, 2004). The total load of phosphorus removed from the influent of the SCRWRF is estimated assuming 70 percent of the households in Spokane County use automatic dishwashers. The phosphorus removal efficiency of the SCRWRF, to treat wastewater influent with 5 mg/L of P to effluent with 0.05 mg/L of P, is approximately 99 percent. Using the same phosphorus removal efficiency of SCRWRF, the total phosphorus load reduction in the effluent by reducing the influent load is shown in Table 11-7.

Table 11-7. Phosphorus Load Reduction through Source Control Programs

Year	Approximate Number of Connected Households (ERU's)	Phosphorus Reduction to Influent, lbs/day ¹	Phosphorus Load Reduction, lbs/day
2010	0	0	0
2015	13,136	42.2	0.422
2020	17,281	55.5	0.555
2025	21,427	68.8	0.688
2030	25,573	82.2	0.822

¹ Assumes 70 percent of households in Spokane County use an automatic dishwasher and treatment process removal rate is 99%.

Regional Non-Point Source Reduction Programs

The *Foundational Concepts* document calls for the NPDES permit holders and the Department of Ecology to jointly fund and implement a regional nonpoint source (NPS) phosphorus reduction program. Initially, a NPS study will be conducted to identify non-point sources, and to develop an implementation plan to reduce NPS pollution. The funding is targeted at \$2 million/year beginning in the second year of the Managed Implementation Plan and continuing for 10 years. The regional non-point source program will be designed to reduce NPS phosphorus contributions to the Spokane River, and contribute to the Delta reduction efforts of the participants.

Potential Non-Point Source Reduction – Lawn and Landscape Fertilizer Restrictions

Phosphorus loading contributed from lawns occurs through two pathways: leaching to groundwater and from runoff. Runoff is suspected to be the greater loading mechanism for lawns. By comparison, leaching to groundwater is the primary loading mechanism from onsite sewage disposal system (septic tank) drainfields.

Spokane County may consider measures to reduce phosphorus loading from fertilizers in the Spokane River watershed through ordinances that ban or restrict phosphorus from commercial fertilizers. In many instances, fertilizers with nitrogen and no phosphorus may actually be an enhancement that helps turf compete with weeds. Many golf courses use low phosphorus fertilizer for this purpose. Whether this is feasible for soils in Spokane County depends on the soil type at each fertilized site. Some soils may need more phosphorus. Ordinances in other parts of the United States that have adopted low, limited, or zero phosphorus allow some phosphorus in fertilizer if a soil test shows a need, or if it is a newly established turf grass area.

A local demonstration may be needed to help promote the acceptability of phosphorus fertilizer bans in the Spokane area. As an example, in the Prior Lake-Spring Lake Watershed District in Minnesota, boy scouts collected over 200 soil samples from the community for analysis and phosphorus was not needed for these locations based on these samples. In this particular case, phosphorus was overly abundant in most of the samples.

The phosphorus content of conventional commercial fertilizers varies considerably. Virtually any mixture of nitrogen, phosphate, and potassium is available to the public for fertilization of landscaping and turf areas. For the purposes of estimating the phosphorus load reduction resulting from a restriction of phosphorus in commercial fertilizers in this *2007 Wastewater Facilities Plan Amendment*, the projected phosphorus load reduction will be based on restricting fertilizer with an N-P-K ratio of 27-10-0 and allowing fertilizer with a ratio of 33-0-0.

Commercial fertilizer is normally applied in areas of urban open space, such as parks, golf courses, and school yards. To estimate the phosphorus load from commercial fertilizer in the TMDL baseline year, the 2001 National Land Cover Dataset project (NLCD) GIS layer was used. This layer was produced cooperatively by the USGS and EPA. The designated class, Land Cover Class # 21 - Developed, Open Space, from this layer is used as a surrogate for estimating the total area of fertilizer application to non-agricultural lands. The total area of

developed, open space within the limits of the Spokane River basin and the boundary of Spokane County was summarized from these data.

Much of the phosphorus applied in fertilizer is used by the crop (e.g., grass), and only a portion of the phosphorus applied in commercial fertilizers will be transported to surface water or leach to groundwater. For the purpose of estimating the loading to surface water and groundwater for this *2007 Wastewater Facilities Plan Amendment*, a phosphorus retention factor of 0.999 is used. Table 11-8 shows the estimated phosphorus load reduction to the Spokane River through a ban of phosphorus in commercial fertilizer based on the TMDL baseline year of 2001, if the ban were to be implemented in 2010.

Table 11-8. Phosphorus Load Reduction through Regulation of Fertilizers

Year	Approximate Area of Developed Open Space, Acres	Phosphorus Fertilizer Application Rate, lbs/acre ¹	Phosphorus Load Reduction, lbs/day
2000	80,000	34.8	0
2005	76,080	34.8	0
2010	72,350	34.8	7.63
2015	68,800	34.8	7.63
2020	65,430	34.8	7.63
2025	62,230	34.8	7.63
2030	59,180	34.8	7.63

¹ Assumes phosphorus in standard commercial fertilizer is applied at a rate of 0.8 lbs/1,000 sf (34.8 lbs/acre).

Spokane County Stormwater Management Program

Phosphorus loads may be reduced through controlling stormwater runoff. The adoption, design, and implementation of phosphorus reducing stormwater best management practices (BMPs) will help limit the phosphorus loading from stormwater runoff. For example, in its Surface Water Design Manual, King County, Washington provides a menu of treatment train options for stormwater for new development that is located within a phosphorus-limited watershed. Such a menu of treatment train options could be provided in Spokane County.

In the Spokane River watershed, the City of Spokane Valley is developing an engineered soil for stormwater treatment to be used in stormwater BMPs, which may have coincidental benefit in reducing phosphorus contributions to groundwater. This engineered soil is expected to be described in the new Spokane Area Stormwater Management Manual. Updated BMPs to control stormwater phosphorus loadings would need to be adopted as local development standards by Spokane County, the City of Spokane Valley, and other local jurisdictions to be effective.

11.3 PROJECTED PHOSPHORUS LOAD TO THE SPOKANE RIVER

As Spokane County proceeds in the future, the phosphorus reduction that results from each of these phosphorus management activities will be quantified and documented for future phosphorus reduction credits. Table 11-9 describes the projected phosphorus reduction to the Spokane River resulting from Spokane County's Phosphorus Management Plan. This table currently contains phosphorus reduction credits for septic tank elimination, and provides an estimate for other future phosphorus management activities. These phosphorus management

activities and credits for phosphorus reduction will be updated as Spokane County further develops and implements these efforts.

The Foundational Concepts document states that “Once an NPDES permit holder demonstrates reliable ability to continually meet its target, either by treatment technology or technology combined with actions to eliminate the Delta, that permit holder will have met its responsibilities for meeting waste load allocations as expressed in either the MIP or the TMDL.” The Foundational Concepts document also authorizes a trading program of dischargers’ with demonstrated surplus phosphorous, consistent with EPA guidelines, pending Ecology’s verification of any surplus phosphorous offset pounds.

Through its Septic Tank Elimination Program and the analysis included in Appendix B, Spokane County has provided reasonable assurance that the delta elimination activity will be accomplished, and reasonable assurance that the results of the delta elimination activity will satisfy the requirements under the Foundational Concepts document to meet an equivalency of 10 µg/L discharge into the Spokane River. The remainder of the potential phosphorus reduction activities discussed in this chapter merely demonstrates additional margins of safety that may be achieved by future activities of Spokane County.

Table 11-9. Summary of Potential Phosphorus Load Reductions to the Spokane River from Potential P Reduction Activities

Year	To Be Developed by Spokane County and Other Stakeholders as Part of the Spokane River TMDL Managed Implementation Plan (MIP)																Total Phosphorus Reduction for "Delta Elimination Plan"			
	Septic Tank Elimination ¹		Treatment Technology Advances ²		Water Conservation ³		Water Reuse		Regional Phosphorus Reduction Programs		Bio-Available Phosphorus Reduction		Source Control Programs		Regional Non-Point Source Reduction Programs					
	lbs/d	lbs/yr	lbs/d	lbs/yr	lbs/d	lbs/yr	lbs/d	lbs/yr	lbs/d	lbs/yr	lbs/d	lbs/yr	lbs/d	lbs/yr	lbs/d	lbs/yr	lbs/d	lbs/yr		
2005	3.8	1,387	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	3.8	1,387
2010/12	6.1	2,227	0	0	0	0	0.768	280	0	0	0.742	271	0	0	7.63	2,785	15.2	5,563		
2015	12.2	4,453	2.67	974	0.126	46	1.08	394	0	0	0.934	341	0.422	154	7.63	2,785	25.1	9,147		
2020	12.2	4,453	2.67	974	0.308	112	2.16	788	0	0	1.16	423	0.555	203	7.63	2,785	26.7	9,738		
2025	12.2	4,453	2.67	974	0.543	198	3.24	1,183	0	0	1.38	504	0.688	251	7.63	2,785	28.4	10,348		
2030	12.2	4,453	2.67	974	0.837	306	4.32	1,577	0	0	1.60	584	0.822	300	7.63	2,785	30.1	10,979		

¹ Phosphorus reduction resulting from septic tank elimination is based upon the minimum load reduction developed in Table 11-2 with a high margin of safety.

² Value is based on operation of SCRWRF with 8 mgd annual average discharge of effluent phosphorus of 0.01 mg/L.

³ Values are based on 0 lbs/day phosphorus load reduction in 2010 from sustainable (e.g., LEED) building construction and is increased linearly to 0.036 lbs/day in 2030. Plumbing code enforcement may reduce overall water demand and wastewater flows by 10 percent reduction in 20 years from 2010 to 2030.