

**Total Maximum Daily Loads (TMDLs)
Lake Carey, Wyoming County**

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March 2, 2001

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ATTACHMENTS

Attachment A.	Carlson Trophic Status Index Paper
Attachment B.	Clean Lake Regulations 40CFR Part 31 & 35, Subpart H
Attachment C.	Pa. DEP Methodology for Lake TMDLs
Attachment D.	Pa. DEP Guidance “Implementation Guidance for Section 95.6 Management of Point Source Phosphorus Discharges to Lakes, Ponds, and Impoundments” excerpt
Attachment E.	Comment and Response Document

INTRODUCTION

This TMDL document was designed to control summer algae blooms caused by excess nutrients in Lake Carey as noted on the Pa. 1996 303(d) list (Table 1). Lake Carey's aquatic life designation is *Cold-Water Fishes* (CWF) for the remainder of the year. The lake meets its designated uses with respect to aquatic life. However, Lake Cary does not meet its recreational designated use. Blue-green algal blooms during the late summer months degrade the aesthetic appearance of the lake and limits water contact recreation (Ulanoski et al, 1981). Phosphorus reductions outlined in this TMDL will prevent problematic algal growth during the late summer months

Pennsylvania does not currently have water quality criteria for nutrients. For this reason, the Carlson Trophic Status Index (TSI) is used as the indicator of lake water quality (Attachment A). The TSI is a ranking based on three measured parameters, total phosphorus, chlorophyll-a, and secchi disc (Pa. DEP, 1999).

SWP	Pa. DEP Stream Code	Year Listed	Data Source	Source Code	Cause Code
4-F	28797	1996	305(b) Report	Agriculture	Nutrients

TSI analysis is used to determine the necessary phosphorous reduction targets for this TMDL. Since Lake Carey is a phosphorous limited lake (page 11), we utilized the established relationship between in-lake phosphorous concentration and TSI to estimate the load reductions that will meet the TMDL's objectives. This TMDL determines that the phosphorus loading to Lake Carey needs to be reduced by 67%.

All information used for the TMDL computations is taken from *Lake Water Quality Assessment: Inventory of Lakes in the Susquehanna River Basin in Pennsylvania and Water Quality Characteristics of Eleven Publicly-Owned Lakes* (Ballaron et al., 1996).

BACKGROUND

Lake Carey is located in Wyoming County, PA, approximately 4.1 miles north of the town of Tunkhannock in Lemon and Tunkhannock Townships, just off State Route 29 (Figure 1). The natural lake is accessible to the public. Land surrounding the lake is privately owned.

The Lake Carey Watershed is a valuable feature of Wyoming County, PA. The watershed contains actively farmed agricultural land, forested areas, and unique recreational activities. The lake serves as a recreational focal point for the year round and large seasonal community. Two tributaries feed into Lake Carey: Meade Brook and an unnamed tributary. Both tributaries flowing into the lake are designated as *cold-water fishes*. It is also important to note that the unnamed tributary, and Meade Brook, have been assessed and Pa. DEP biologists have determined that they meet their designated use. Billings Mill Brook serves as the outfall of the

lake. This stream has also been assessed by Pa. DEP and is meeting its designated use as *cold-water fishes*. The brook feeds into Tunkhannock Creek, which flows into the North Branch of the Susquehanna River.

Previous studies show elevated nutrient concentrations during the summer months. These nutrient concentrations have also been linked to blue-green algae blooms in the lake during the summer months (Ballaron et al., 1996). Aquatic plant growth is limited to the shallow waters in the southern portion of the lake.

Agricultural runoff in the watershed has been largely reduced through best management practices promoted by the Wyoming County Conservation District. These practices have been recently implemented, and no monitoring has been done to assess the effectiveness of such measures. Due to questions of the effectiveness of these BMPs, agricultural land uses were still included in the allocation scenario. Until the effectiveness the BMPs can be evaluated, the agricultural runoff must be addressed by the TMDL. However, it is important to note that runoff from the agricultural lands drain into the two contributing tributaries that Pa. DEP have assessed as attaining their designated uses as *cold-water fishes*.

Internal loading and septic systems are contributing to the excess nutrient concentrations in the lake. Ballaron (1996) states that algal growth “die-off” leads to nutrients settling in the lake bottom sediments. Nutrients are then released back into the water column. Septic systems are also documented to contribute significant amounts of nutrients when located within 300 feet of a lake shore (U.S. EPA, 1980). Lake Carey has a significant number of residences using septic systems located well within 300 feet of the shore.

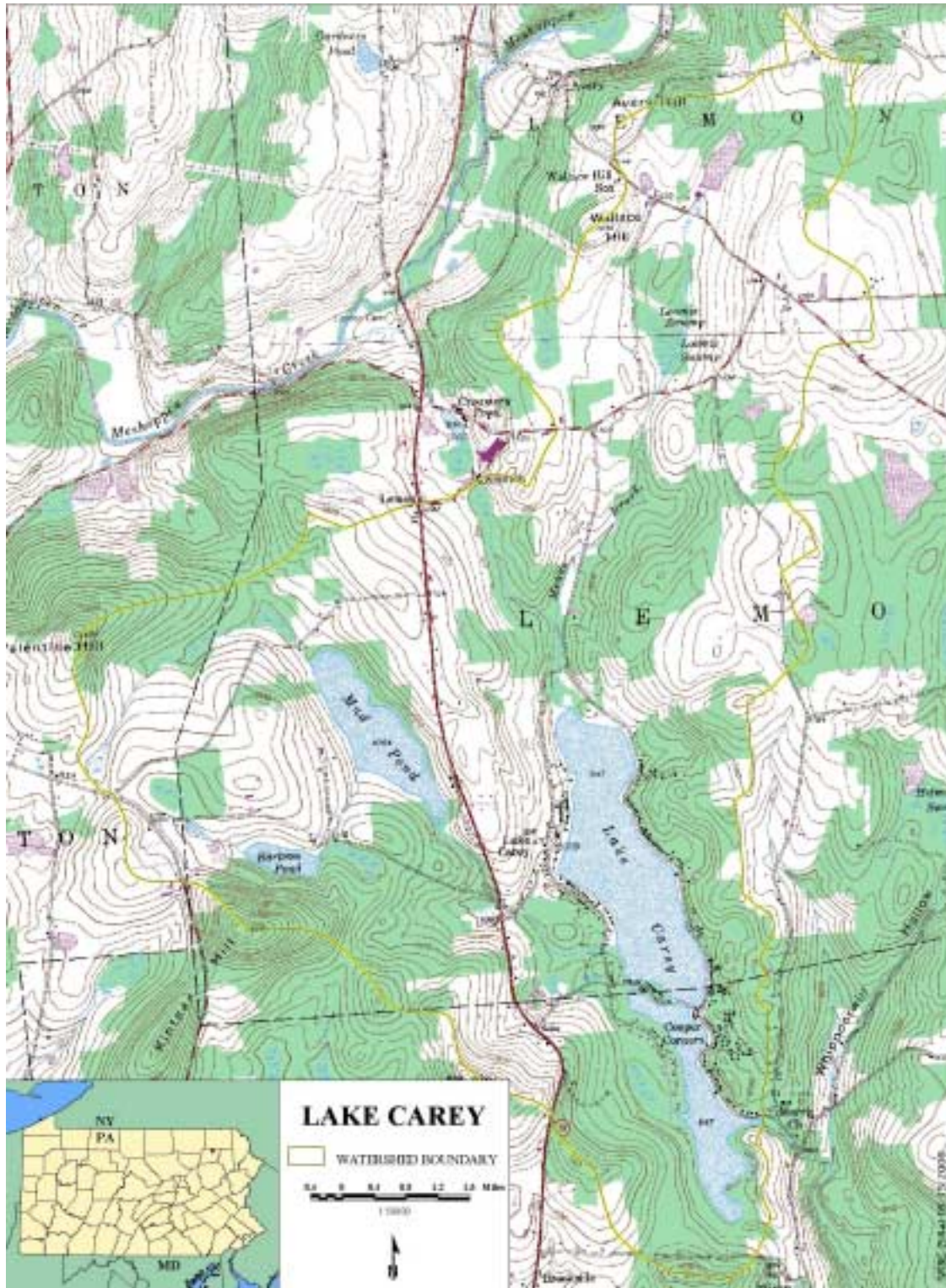


Figure 1. – Location map for Lake Carey.

DATA COMPILATION

The Susquehanna River Basin Commission collected water-quality samples during April, June, and August of 1995 at two locations. The samples were taken at one and nine meters depth in one location and at one meter at the second location. No samples were taken at nine meters depth at the second location due to lack of water depth at this part of the lake. A detailed description of sampling methods and parameters analyzed can be found in *Lake Water Quality Assessment: Inventory of Lakes in the Susquehanna River Basin in Pennsylvania and Water Quality Characteristics of Eleven Publicly-Owned Lakes* (Ballaron et al., 1996).

The following table shows the lake data used for the TSI computations. Tables 2 and 3 present data for the Lake Carey Watershed.

Data	Value	Source
Lake Type	Oxic	Attachment D
Lake Status	Regular	There is no special protection for the lake
Existing P concentration	0.0723 mg/l	Calculated value from Unit Area Loading equation
Hydraulic Residence Time	280 days	Ballaron et al. (1996)
Mean Depth	22 feet	Ballaron et al. (1996)

Data	Value	Source
Drainage basin size	~4.5 miles ² (~2880 acres)	Ballaron et al. (1996)
Geology	Upper Devonian shale and sandstone	Ballaron et al. (1996)
Soils	Silt loam formed on Wisconsin till	Ballaron et al. (1996)

Since there are no point sources located in the watershed upstream of Lake Carey, all pollutant contributions to the lake are from nonpoint sources. The existing phosphorous concentration represents the average annual concentration in the lake based on the unit area loadings shown in Table 4. These loadings were computed based on land use type and accepted land use runoff coefficients (Table 4). This value is consistent with the observed values by Ballaron et al. (1996). These loadings were calculated using coefficients determined Reckow (1983) and used by the Phase One Clean Lakes Studies conducted by Coastal Environmental Services for Pa. DEP in 1994. The coefficients, when multiplied by the number of acres, produce loads for the selected land use.

A loading rate for phosphorus of 1.2 lbs/yr/capita was used to compute the contribution from septic systems, based on a population of 800 individuals and a 15% septic removal rate (Reckow

et al., 1980; U.S. EPA, 1980). Load reductions for phosphorous were based on the necessary reduction in the in-lake phosphorous concentration needed to achieve the target TSI of 50.

Internal regeneration of phosphorus from bottom sediments is also a cause of impairment in Lake Carey. Seasonal turnovers in the lake re-introduce nutrients into the water column. This will become an increasing source of phosphorus loading as the lake ages.

Table 4. Unit Area Loading for Lake Carey

Land Use	Area (Acres)	% Total Land Use*	Parameter	Runoff Coefficient	lb/yr
Agriculture	1065	37%	Total P	0.535	569.9
Forested	1296	45%	Total P	0.177	229.3
Residential	288	10%	Total P	0.446	128.4
Internal	--	--	Total P	--	697.3
Septic System**	--	--	Total P	--	1020
Lake Surface	230	8%	Total P	-0.26	-59.9
TOTAL	2879	100%			2585

*Percent Land Use from Ballaron et al. (1996).

**Septic system loads were estimated based on the annual average population of 800 residents and 1.2 lb/yr/capita phosphorus loadings from septic systems.

Based on the readily available, recent, and reliable data for Lake Carey, it was determined that by controlling phosphorous loadings into the lake, phosphorous will become the limiting nutrient (see page 12). The lake is currently hypereutrophic due to nutrient loadings (see Existing Conditions, page 13, for more information on the current lake status).

No Clean Lakes Study was performed for Lake Carey.

CONSIDERATION OF CRITICAL CONDITIONS

Considering the existing data for Lake Carey, it is impractical to explicitly consider critical conditions in terms of pollutant loading and in-lake conditions. This approach would require extensive data and continuous model simulation of the watershed and lake. By expressing this TMDL as an annual load, we have implicitly considered both storm and dry weather loads. It is our position that establishing this TMDL using average annual conditions is protective given the

generally significant lag time between introduction and impact of use by nutrients to a water body.

SEASONAL VARIATION

As stated in the *Critical Conditions* section, annual loads consider both storm and dry weather loads. Algal blooms have been documented to be a problem during the late summer months, generally characterized by drier seasonal conditions, or low flow conditions. Using an annual loading rate that includes a greater number of runoff events is protective of the water body.

EXPLANATION OF TMDL COMPUTATIONS FOR PHOSPHORUS

A detailed explanation of the Pa. DEP Lake Methodology of TMDL development can be found in Attachment C.

The TMDL was computed by the following methods:

1. An existing TSI and phosphorus load were computed using the equations contained in the *Lake for Windows* program “TSI Only” option. The results are shown in the equation below and Table 5 (see page 12 for detailed analysis).

Existing TSI

$$\text{TSI} = 14.42 * \text{LN} (1000 * [\text{Total P}]) + 4.15 \quad (\text{Pa. DEP, 1999})$$

$$\text{TSI} = 14.42 * \text{LN} (1000 * [0.0723]) + 4.15$$

$$\text{TSI} = 65.9$$

TMDL TSI

$$\text{TSI} = 14.42 * \text{LN} (1000 * [\text{Total P}]) + 4.15 \quad (\text{Pa. DEP, 1999})$$

$$\text{TSI} = 14.42 * \text{LN} (1000 * [0.0240]) + 4.15$$

$$\text{TSI} = 50$$

Table 5. Summary of TSI Scenarios

Scenario	In-lake P concentration (mg/l)	TSI	Load (lb/yr)
Existing Conditions	0.0723	65.9	2585
Target TMDL	0.0240	50	860

2. The TSI of 50 was chosen as the TMDL target as it represents the boundary condition between a mesotrophic and eutrophic lake, and signifies a reasonably achievable target (Pa. DEP, 1999). Lake Carey is currently hypereutrophic (TSI = 65.9). The target TMDL load associated with a TSI of 50 is 860 lb/yr using the *Lake for Windows* program (Table 5) (see TMDL Target Lake TSI Evaluation, p. 14, for more

information). A TSI of 50 has also been empirically linked to an average concentration for chlorophyll-a of 6.4 micrograms/liter (Pa. DEP, 1999). Studies by Walmsley (1979) show that at concentrations of less than 10 micrograms/liter, no water-quality problems associated with algal growth are evident.

3. Annual septic system loads were determined by multiplying the average annual per capita phosphorus load by the average annual population surrounding Lake Carey. The average annual per capita phosphorus-loading rate for septic systems is 1.2 lb/capita/year (Reckow et al., 1980; USEPA, 1980). The average number of annual residents surrounding the lake is approximately 800 individuals. This number was averaged from county census data available from GIS coverages available on Penn State University's PASDA website and 1999 U.S. Bureau of Census data.
4. The controllable load is determined using the TMDL equation (1) shown below. The phosphorus load from the forested land use and in-lake biological consumption is accounted for in the uncontrollable portion of the target TMDL load. In-lake biological consumption refers to phosphorus used for algal growth, as calculated by the "Lake for Windows" model. The MOS is subtracted from the target TMDL. The remaining 604.6 lb/yr of phosphorus is allocated among the land use categories in the watershed using the Equal Marginal Percent Reduction (EMPR) allocation method (Attachment D).

$$\text{Target TMDL} = \text{uncontrollable load} + \text{controllable load} + \text{margin of safety (MOS)} \quad (1)$$

$$\text{Uncontrollable Load: } 229.3 \text{ lb/yr} - 59.9 \text{ lb/yr} = 169.4 \text{ lb/yr}$$

$$\text{MOS: } 10\% \text{ of the target TMDL load: } 860 \text{ lb/yr} * 0.10 = 86.0 \text{ lb/yr}$$

$$\text{Controllable Load: } 860 \text{ lb/yr} - 169.4 \text{ lb/yr} - 86.0 \text{ lb/yr} = 604.6 \text{ lb/yr}$$

5. The TMDL load for phosphorus is divided by the existing phosphorus load to determine the percent reduction. Table 6 shows the individual land use phosphorus reductions and Table 7 shows the cumulative phosphorus load and percent reduction.

$$\text{Percent reduction} = 1 - (\text{TMDL load/existing load})$$

Table 6. Annual Phosphorus Loading Values (lb/yr) for Lake Carey				
Land Use Category	Area (ac)	Current Load (lb/yr)	TMDL Target	Percent Reduction of Annual Load
Agriculture	1065	569.9	230.3	60
Residential	288	128.4	62.2	52
Septic System	--	1020	229	77
Forest	1296	229.3	229.3	0
Internal Loading	--	697.3	83.1	88
Open Water	230	-59.9	-59.9	0
Margin of Safety	--	--	86.0	--
TOTAL	2879	2585	860	67

Table 7. Summary of Phosphorus Reductions			
PARAMETER	Existing Load (lb/yr)	TMDL Load (lb/yr)	Percent Reduction to meet TMDL
Total Phosphorus	2585	860	67

These TMDLs implicitly consider seasonal variation by expressing the loads as annual averages. The annual load comprises both storm flow and dry weather loads associated with seasonal variation.

RECOMMENDATIONS

The limnological survey of Lake Carey identified the water quality problems in Lake Carey. This TMDL was developed to determine the necessary reductions in phosphorus, the pollutant of concern, needed for the lake to meet water quality standards. For most of the life of the lake, external loading from agricultural runoff was the major source of pollutants. However, it is believed that the agriculture source of phosphorus has been significantly reduced through best management practices (BMPs). Until the effectiveness the BMPs can be evaluated, the agricultural runoff must be addressed by the TMDL. Residential development within several hundred meters of the lakeshore is fairly dense along certain sections, and septic system contribution of phosphorus is estimated to be significant. In addition, as the lake fills with sediment, another major source of phosphorus is internal regeneration from the bottom sediments.

As noted in the TMDL document, control of the external load by implementation of BMPs will result in reduced nutrient accumulation. Over time the control of the external load will result in

an inherent reduction of internal loading. Removal of in-lake nutrients and control of additional external nutrient loading would provide substantial reduction of the in-lake phosphorous concentration.

A number of potential lake and watershed management measures are described below. The most suitable restoration measures for reducing internal loading in Lake Carey will need to be determined as part of a restoration project that could be funded through several grants currently available including Federal Section 319 money, WRAP grants, Watershed Protection and Environmental Stewardship Grants or the state Growing Greener Program.

CONTROL OF INTERNAL SOURCES

Dredging

Dredging projects have the immediate benefit of removing silt accumulations to restore portions of a lake to its original depth. Dredging is often relatively expensive when compared to other lake restoration methods. However, these costs are often offset by the long-term benefits. Dredging to depths below the photic zone limits the amount of light that reaches the bottom sediments. As a result, aquatic weed growth is limited.

Dredging, however, can often have a significant impact on lake ecosystems. It can destroy the benthic community, including fish food organisms. The lake ecosystem could take several years to recover if the entire lake bottom is dredged. A bathymetric survey of Lake Carey should be conducted to determine optimal locations for dredging.

Aquatic Plant Harvesting

The majority of nutrients for aquatic plant growth are obtained from phosphorus in sediments. As they die off and decay, nutrients are re-released into the water column to be recycled again. Harvesting macrophytes removes the majority of the biomass from the lake, hence reducing the nutrient contributions released upon decay.

Nutrient Inactivation

Nutrient inactivation works by binding phosphorus and making it unavailable for algal growth. Although other salts, such as iron and calcium, can also inactivate phosphorus, aluminum is the most popular since it binds tightly to phosphorus over a wide range of ecological conditions, including low or zero dissolved oxygen. When aluminum sulfate or sodium aluminate is added to the lake, a flocculent of aluminum hydroxide is formed. This flocculent binds with phosphorus in the water column and carries it to the bottom as the flocculent settles. The settled flocculent creates a layer of aluminum hydroxide on the lake bottom that is 1-2 inches thick. The settled flocculent significantly retards phosphorus release from the lake sediments.

Aluminum use is highly effective in reducing phosphorus concentration and has long lasting influence on internal loading, particularly when combined with dredging. However, it can have

potential disadvantages associated with aluminum toxicity. Treatments are lake specific and the dosage rate must be carefully calculated.

CONTROL OF EXTERNAL SOURCES

As mentioned before, runoff from agricultural land has been addressed through best management practices. However, the extent to which loads have been reduced has not been quantified through monitoring. The remaining sources are associated with residential land use and septic systems.

Residential development surrounding Lake Carey is fairly dense. A significant number of residences lie within 200 meters of the lakeshore. Installation of vegetative buffers could have very positive effects on reducing phosphorus loads. Currently, vegetative cover is very sparse in the developed areas. These vegetative buffers could serve two purposes. It would reduce runoff from residential lots, and reduce the amount of phosphorus reaching the lake from septic tanks.

In addition, a survey of failing septic systems would also be a viable alternative. Upgrading failing systems to current specifications could significantly reduce the amount of phosphorus reaching the lake.

PUBLIC PARTICIPATION

Public meetings to discuss and accept comments on proposed TMDLs were held on January 18, 2001 beginning at 2:00 p.m. and 7:00 p.m., at the Pennsylvania Department of Agriculture Building in Tunkhannock. Public notice of the draft TMDL and the public meeting was published in the *Pennsylvania Bulletin* and the *Lancaster Intelligencer*. Notice of final plan approval will be published in the *Pennsylvania Bulletin*.

REFERENCES

- Ballaron, P.B., S.W. Bollinger, and D.L. Sitlinger. 1996. Lake Water Quality Assessment: Inventory of Lakes in the Susquehanna River Basin in Pennsylvania and Water Quality Characteristics of Eleven Publicly-Owned Lakes. Susquehanna River Basin Commission, Publication Number 177.
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- U.S. Environmental Protection Agency. 1980. Onsite Wastewater Treatment and Disposal Systems. U.S. Environmental Protection Agency, EPA-625/1-80-012.
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LIMITING NUTRIENT DETERMINATION

Determination of Limiting Nutrient for Lake Carey:

At one meter depth:

Mean Nitrogen concentration: 1.25 mg/l
Mean Phosphorus concentration: 0.0723 mg/l

Ratio of N/P: 17.3

Based on Pennsylvania's *Implementation Guidance for Section 95.6 Management of Point Source Phosphorus Discharges to Lakes, Ponds, and Impoundments* (Pa. DEP/ 391-2000-010), a Nitrogen/Phosphorus ratio of 7/1 to 15/1 indicates co-nutrient limitation. Because the ratio for Lake Carey is 17.3/1, phosphorus was determined to be the limiting nutrient and used for the TMDL target. Data from one-meter depth were utilized for limiting nutrient determination as prescribed in the Pennsylvania document.

EXISTING CONDITIONS LAKE TSI EVALUATION

Lake Name:	Lake Carey
Type:	Oxic
Status:	Regular
Existing Phosphorus Concentration (mg/L):	0.0723
Residence Time (days):	280
Surface Area (acres):	230
Mean Depth (meters):	6.7
Comment:	Lake is currently Hypereutrophic
Expected TSI:	65.90
Expected Load (lb/ac/yr):	11.24

TMDL TARGET LAKE TSI EVALUATION

Lake Name:	Lake Carey
Type:	Oxic
Status:	Regular
Existing Phosphorus Concentration (mg/L):	0.0240
Residence Time (days):	280
Surface Area (acres):	230
Mean Depth (meters):	6.7
Comment:	Lake is currently Eutrophic
Expected TSI:	50.0
Expected Load (lb/ac/yr):	3.74

Comment and Response Document Lake Carey TMDL

Comment: How will the TMDL's recommendation by the SRBC, dated 11/30/00, impact the fish, wildlife and human use of Lake Carey? In the aforementioned report (p.9 "Nutrient Inactivation") it states "The flocculent creates a layer of aluminum hydroxide on the lake bottom that is 1 - 2 inches thick." With this fact in mind, how will the bottom-feeding fish survive if the flocculent covers their food supply?

Response: In reference to the "Nutrient Inactivation" section, these recommendations may not necessarily represent the best course for remediation efforts. Information on potential remediation activities, including BMPs, was provided as an indication that the identified load reductions were achievable. The information should prove helpful to those developing plans to meet the specified reductions. While the Department insures compliance with all applicable laws and regulations, the most effective and achievable means of meeting the goals set forth in these TMDLs will come from the local level. The Department will also provide organizational, technical and financial assistance to watershed groups who undertake implementation. Please contact the Department if you want further information.

Comment: p.9 mentions that "Aluminum use is highly effective in reducing phosphorus concentration and has long-lasting influence on internal loading, particularly when combined with dredging. However, it can have potential disadvantages associated with aluminum toxicity. Treatments are lake specific and the dosage rate must be carefully calculated."

* What is meant by the term "long-lasting influence"?

* What are the "potential disadvantages associated with aluminum toxicity"?

Response: Again, the recommendations were included to provide some direction/guidance, not to mandate what should be done. Additional study would be required to determine the best possible remediation activities suited for Lake Carey.

Comment: Since p.5 also states that "No Clean Lake Study was performed on Lake Carey", how can the SRBC recommend treatments?

Response: See previous responses concerning "recommendations".

Comment: What toxins, if any, were found the fish in Lake Carey and its tributaries?

Response: To date the Department has not conducted fish tissue sampling in Lake Carey.

Comment: If toxins were/are present in the above mentioned fish, is there existing historical documentation available for public viewing; if so, where?

Response: To date the Department has not conducted fish tissue sampling in Lake Carey.

Comment: How toxic to human consumption are the fish found in Lake Carey and its tributaries?

Response: To date the Department has not conducted fish tissue sampling in Lake Carey.

Comment: What are the current acceptable government guidelines for safe toxicity levels in Lake Carey and its tributaries?

Response: All water bodies within the Commonwealth must meet the designated water-quality standards and meet its designated uses. The Department follows the "Protocol for a Uniform Great Lakes Sport Fish Consumption Advisory" dated September 1993, in issuing fish consumption advisories related to PCB.

Comment: It is common knowledge that two- cycle engines contribute highly to air and water pollution. Knowing that along with unburnt gasoline, benzene, MTBE's and other cancer-causing agents are entering our waterways with each boat's exhaust, how can the DEP and the SRBC allow the use of such engines on Lake Carey?

Response: The TMDL does not address the above-mentioned chemicals. Under current regulations, TMDLs are only developed for those sources and causes of impairment found on the 303(d) list. The 1996 303(d) indicates the cause of impairment in Lake Carey to be nutrients.

Comment: It is also commonly known that the destruction of over 70 transformers at Lake Carey was caused by the tornado of June 2, 1998.

* What PCB studies have been done on the surrounding soil, the lake water and the lake tributaries?

* At the meeting, DEP Representative Travis Stoe mentioned the existence of a 1996 report on Lake Carey's PCB levels. Can the public access this and any other records concerning this chemical?

Response: The TMDL does not address PCBs. The 1996 report mentioned by Travis Stoe contains no PCB data. The report can be obtained from the Susquehanna River Basin Commission. Under current regulations, TMDLs are only developed for those sources and causes of impairment found on the 303(d) list. The 1996 303(d) indicates the cause of impairment in Lake Carey to be nutrients.

Comment: There are public concerns as to the installation of sewers in the immediate area surrounding Lake Carey.

* Will this installation allow for future land development in the under- developed areas surrounding the lake, or will the proposed plan support only existing residences, requiring future expansion costs to be the burden of the land owners?

Response: The TMDL does not address local zoning/development issues. These sort of issues would be more appropriate to direct to your local government officials

Comment: It is common knowledge that the cinders, salt and brine water solution used by PennDOT for ice control can be highly toxic. There are concerns as to PennDOT's responsibility for storm-water runoff.

- *What effect have these substances had on the surrounding soil, Lake Carey's water and that of its tributaries?
- * What area is going to be designated as the storm -water runoff area when flooding due to storms occurs?
- * What impact will these materials and substances have on the storm-water runoff area's soil when flood conditions arise?
- * Why is Penndot not responsible for some of the sewer system's costs? Penndot clearly has a need for usage of the system that falls outside the realm of usage by the individual landowners.

Response: The TMDL was developed to address the impacts noted on the 1996 303(d) list. The 1996 303(d) indicates the cause of impairment in Lake Carey to be nutrients. If at a future time the lake is deemed to be impaired by other pollutants, a separate TMDL will be developed to address them.

Comment: Under Governor Ridge's "Growing Smarter" initiative, dated 8/30/00, DEP land-use involving "environmental /land use in State Permit Reviews", it states the following: "DEP also can approve the permit where a conflict is considered minor or where other public needs may outweigh land-use concerns." The SRBC's TMDL document for Lake Carey states: "The natural lake is accessible to the public. Land surrounding the lake is privately owned."

- * In light of the two statements above, is there a probability that Lake Carey land owners could lose their properties to eminent domain?
- * If so, is this constitutionally acceptable?

Response: The Department has no information to suggest that Lake Carey land owners could lose their properties to eminent domain.

Comment: According to the SRBC's TMDL report (p.1) "Blue-green algal blooms during the late summer months degrade the aesthetic appearance of the lake and limit water contact recreation." At the public meeting DEP Rep. Travis Stoe mentioned that currently there is no monitoring system set up at the entry points of the inbound/outbound tributaries of Lake Carey.

- * If this is the case, how can agricultural runoff be tracked?
- * The SRBC TMDL document also states (p2) "no monitoring (of agricultural runoff) has been done to assess the effectiveness of such measures." Will such measures be taken, and when?

Response: There are grants available through DEP to fund monitoring activities within watersheds. The most effective and achievable means of meeting the goals set forth in this TMDL will come from the local level. The Department will also provide organizational, technical and financial assistance to watershed groups who undertake implementation. Please contact the Department if you want further information.

Comment: How will the geese and duck population be controlled, since they also contribute to the pollution of the lake?

Response: Based on the response above, recommendations for pollution control will be most effective coming from the local level. If the geese and duck population are

determined to be a major contributor of pollutants, this can be considered in a remediation plan.

Comment: Why are there no warning signs posted, regarding the pollution in the lake, to alert the public to the health and safety hazards of swimming and fishing?

Response: The algal blooms are predominantly an aesthetic problem, posing no significant threat to human health.

Comment: If the recommendations of the SRBC's TMDL document (p.9) regarding aquatic plant harvesting and nutrient inactivation are implemented, will the outcome be the destruction of habitats for the spawning and protection of the local fish population?

Response: Further study would be needed to develop a plan for possible remediation activities. The local fish population would be considered when implementing any remediation activities, and the protection of their habitat would be a priority.

Commentors

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