APPENDIX D

NUTRIENT LISTING METHODOLOGY FOR LAKES AND RESERVOIRS

NEW MEXICO ENVIRONMENT DEPARTMENT
SURFACE WATER QUALITY BUREAU

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Purpose and Applicability

Nutrient impairment occurs when algae and other aquatic vegetation (macrophytes) interfere with designated uses such as recreation, water supply, or aquatic life. Excess amounts of nitrogen and phosphorus can cause increases in undesirable aquatic life (e.g., community composition shifts or toxic algal blooms) and/or result in a dominance of nuisance species (e.g., excessive and/or unsightly algal mats or surface plankton scums). Excessive algal growth may cause anaerobic conditions resulting in fish kills or loss of sensitive species.

With the recognition of the pervasiveness and potential severity of nutrient-related problems comes the need to accurately monitor and assess nutrient impairment. This document establishes an assessment protocol for determining the nutrient impairment status of lakes and reservoirs. While a few lakes have segment specific numeric criteria for total phosphorus (TP), New Mexico currently has no general numeric criteria for nutrients. The narrative criterion in *State of New Mexico Standards for Interstate and Intrastate Surface Waters* found at 20.6.4.13 NMAC (available at: https://www.env.nm.gov/surface-water-quality/wqs/) states:

> *Plant nutrients from other than natural causes shall not be present in concentrations which will produce undesirable aquatic life or result in a dominance of nuisance species in surface waters of the state.*

This document will be used to determine if a lake or reservoir is meeting the narrative criterion. Impairment threshold values are used to translate the narrative criterion into quantifiable endpoints. Threshold values are derived from water quality standards (WQS), Surface Water Quality Bureau (SWQB) analyses of existing data, or published literature. Nutrient enrichment indicators, including TP, total nitrogen (TN), and chlorophyll *a* (chl-a), are compared to threshold values to determine impairment. To address the "*from other than natural causes*" portion of the criterion, designated or assigned aquatic life use is used to classify sites in order to define reference conditions that account for New Mexico's complex landscape and high biodiversity. If a water body is determined to be impaired, it will be added to the Integrated Clean Water Act §303(d)/§305(b) List of Assessed Waters (Integrated List) as impaired.

This protocol is a dynamic document and subject to refinement as more data are collected and analyzed, enabling more precise classification of lentic systems and clearer definition of the relationships between nutrient concentrations, indicators, and impairments of New Mexico lakes and reservoirs. In the event that new data indicate that the threshold values presented in this document are inaccurate and/or if new standards are adopted, the threshold values will be adjusted accordingly.

This protocol is <u>not</u> applicable to the following water body types:

- Perennial, wadeable streams (see Appendix C of the Assessment Protocols)
- Wetlands and playas

A separate nutrient assessment protocol for perennial, wadeable streams (Appendix C of the Listing Methodologies) is available at: https://www.env.nm.gov/surface-water-quality/calm/.

Additional information on nutrient threshold development is available on the SWQB website at: https://www.env.nm.gov/surface-water-quality/nutrients/.

1.0 Introduction/Background

The presence of some aquatic vegetation is normal in lakes and reservoirs. Algae and macrophytes provide habitat and food for other aquatic organisms. However, excessive aquatic vegetation is not beneficial to most aquatic life and may change the associated community structure. High nutrient concentrations may promote an overabundance of algae and floating or rooted macrophytes. The types and amounts of aquatic vegetation often reflect the level of nutrient enrichment. Algae are either the direct (excessive periphyton mats or surface plankton scums) or indirect (diurnal swings of dissolved oxygen and pH as well as high turbidity) cause of most problems related to excessive nutrient enrichment. In addition, algal blooms can cause taste and odor problems in drinking water supplies. One of the most expensive problems caused by nutrient enrichment is increased treatment required for drinking water. Blooms of certain types of blue-green (cyanobacteria) and golden (*Prymnesium* spp.) algae can produce toxins that are detrimental to fisheries in addition to animal and human health (Graham et al. 2016).

Limited increases in primary productivity (e.g., aquatic plants or algae) can increase the abundance of aquatic life such as invertebrates and fish in lakes and reservoirs. Alternatively, excessive plant growth and subsequent decomposition can limit aquatic populations by decreasing dissolved oxygen (DO) concentrations as plant respiration and decomposition of dead vegetation consumes DO. Lack of DO stresses aquatic organisms and can cause fish kills; even relatively small reductions in DO can have adverse effects on both invertebrate and fish communities. Nocturnal respiration can cause oxygen depletion in waters with high primary productivity and low aeration rates. Development of anaerobic conditions due to oxygen depletion alters a wide range of chemical equilibria, may mobilize certain pollutants, and generates noxious odors (EPA 1991).

The variables referred to in this document are measurable water quality parameters that can be used to evaluate the degree of eutrophication in lakes and reservoirs. The parameters consist of causal variables (TN and TP concentrations) and response variables (algal biomass determined by chlorophyll a (chl-a) concentration, % cyanobacteria, DO concentration, and pH). The typically large watershed-to-lake size ratio of many impoundments in arid landscapes can have great influence on both nutrient loading and biomass production. Additionally, low and middle elevation lakes and reservoirs in New Mexico may have naturally high levels of productivity due to nutrient loading, long growing seasons, and high temperatures. Many other factors come into play in lentic systems, including size and depth of the lake, residence time of the water, and geology of the surrounding area. Additional factors will be noted during monitoring to aid in interpretation of measured variables.

Available information does not allow identification of definitive and broadly-applicable water quality thresholds beyond which a particular designated use is always impaired in all water bodies. For the most part, nutrient-related impacts are gradational (chronic) rather than characterized by sharp transitions (acute). Furthermore, lakes and reservoirs are complex biogeochemical systems subject to many site-specific factors that affect responses to nutrient loading. Another challenge is the relatively small number of studies designed to identify nutrient-related thresholds of designated use impairment. Despite these challenges, the basic relationship between nutrient enrichment and use impairment in lakes and reservoirs is recognized.

2.0 Development of the Numeric Thresholds

This assessment approach considers multiple lines of evidence to make a final impairment determination. The abundance of confounding factors and indirect and fluctuating nature of the relationships between these factors make the use of a single variable for assessment challenging. Because of this, a suite of indicators is used in a weight-of-evidence approach to provide a more comprehensive and defensible assessment. The nutrient assessment is based on quantitative measures of both causal and response variables (EPA 2010).

Aquatic life uses (i.e., coldwater, warmwater) are generally defined by water temperatures and other characteristics that are known to support the growth or propagation of certain aquatic species. Assessment of the DO and pH indicators is dependent upon the designated aquatic life use, associated numeric criteria, and established procedures for assessing DO and pH, respectively. For assessment of the other indicators (i.e., TN, TP, chl-a, and cyanobacteria), New Mexico's lakes and reservoirs are grouped into three categories based on their designated aquatic life use(s) or assigned lake type. The lake groups include coldwater (COLD), warm water (WARM), and sinkholes (SINKHOLES). All reservoirs and high-elevation lakes with high quality coldwater aquatic life (HQCWAL) or coldwater aquatic life (CWAL) designated uses are assigned to the COLD group, while those with marginal CWAL, warmwater aquatic life (WWAL), or marginal WWAL designated uses are assigned to the WARM group. Sinkhole lakes are classified separately from other lakes and reservoirs because they are groundwater-fed, which results in unique chemical properties, and, in general, they are more influenced by the surrounding geology than adjacent land use.

Some lakes do not fit directly into one of the three lake groups. Specifically, New Mexico's coolwater aquatic life use designation was not in effect when data analyses and threshold development for this assessment protocol occurred. There are currently seven reservoirs that are designated in 20.6.4 NMAC with a coolwater aquatic life use. There are also six lakes with dual WWAL and CWAL designated uses. Given that these lakes do not fit directly into one lake group, lakes and reservoirs with coolwater or dual CWAL/WWAL uses were assigned a lake group based on the dominant fish community in the water body. The dominant fish community for these lakes was determined by examining fish community composition data and/or discussions with New Mexico Department of Game and Fish personnel. Figure 1 contains a generalized flowchart for assigning the appropriate lake group. Table 1 indicates the lake group assignments for thirteen water bodies with coolwater or dual aquatic life uses.

There are a few instances of segment-specific TP criteria in 20.6.4.97 - 20.6.4.899 NMAC. These will not be used to determine impairment of the narrative nutrient criteria found at 20.6.4.13.E NMAC. TP will additionally be assessed as a separate parameter in these cases, following the procedures detailed in Section 3.1 of the main Listing Methodology https://www.env.nm.gov/surface-water-quality/calm/).

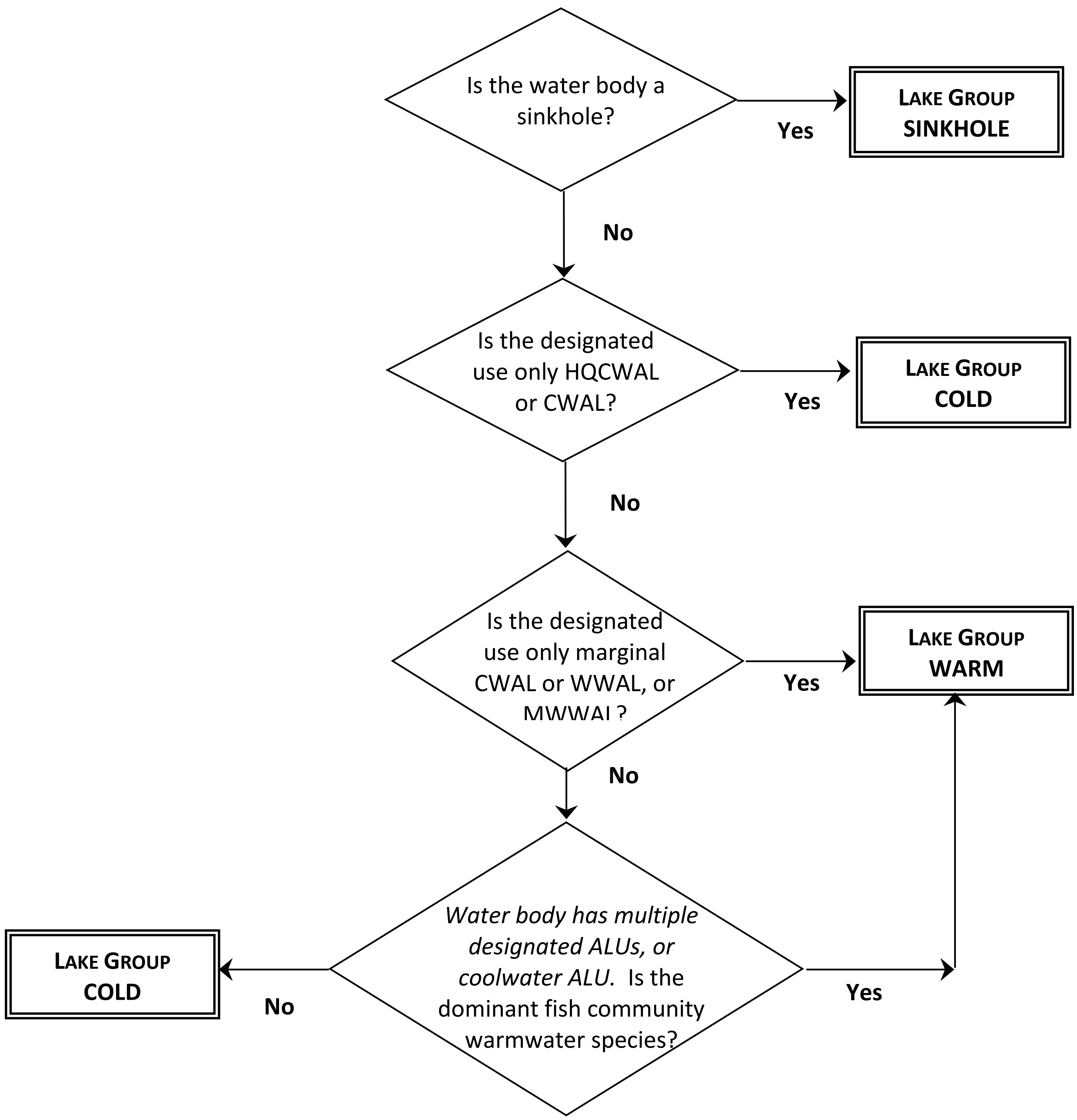

Figure 1. Generalized flowchart for determining lake group assignments

Table 1. Lake group assignments for evaluating TN, TP, chl-a, and cyanobacteria

Reservoir or Lake	Designated Aquatic Life Use(s)	Assigned Lake Group
Abiquiu Reservoir	CWAL/WWAL	COLD
Bill Evans Lake	CoolWAL	WARM
Charette lakes	CWAL/WWAL	WARM
Clayton Lake	CoolWAL	WARM
Jackson Lake	CoolWAL	WARM
Lake Farmington	CWAL/WWAL	WARM
Monastery Lake	CoolWAL	COLD
Navajo Reservoir	CWAL/WWAL	COLD
Quemado Lake	CoolWAL	WARM
Ramah Lake	CWAL/WWAL	WARM
Santa Rosa Reservoir	CoolWAL	WARM
Springer Lake	CoolWAL	WARM
Storrie Lake	CWAL/WWAL	WARM

Potential nutrient enrichment indicators for TN, TP, algal biomass, % cyanobacteria, as well as Secchi depth were collated from SWQB analyses, other state agency examples, or published literature. The indicators and respective threshold values selected for New Mexico lakes, reservoirs, and sinkholes are listed in Table 2. This selection was based on best professional judgment with respect to New Mexico's ecoregions. Additional information on all of the candidate thresholds is provided in Table 3.

Table 2. Nutrient-related impairment threshold values for New Mexico's lakes and reservoirs

	CAUSAL VARIABLES		RESPONSE VARIABLES			
Lake Group	**TP (mg/L)**	**TN (mg/L)**	**chl-a (µg/L)**	**% Cyano-bacteria[a]**	**DO[g] (mg/L)**	**pH[g]**
COLD	≤ 0.03 [b]	≤ 0.9[c]	≤ 7.5 [b]	≤ 38% [c]	*See NMAC for applicable DO and pH criterion*	
WARM	≤ 0.04[c]	≤ 1.4[c]	≤ 11[d]	≤ 38% [c]		
SINKHOLE	≤ 0.025 [e]	≤ 1.42 [e]	≤ 3.5[f]	-		

NOTES:

a. The cyanobacteria thresholds are expressed as a percentage of the total algae count.
b. Boundary between mesotrophic and eutrophic lakes (Nürnberg 1996).
c. Threshold values were derived from change point and regression tree analyses of water quality data from New Mexico (Scott and Haggard 2011).
d. Thresholds for Kansas Central Plains & SW Tablelands (Dodds 2006).
e. 75th percentile of NM sinkhole lake data.
f. Thresholds between oligotrophic and mesotrophic lakes (Nürnberg 1996).

g. *DO and pH criteria are based on the designated aquatic life use(s) of the lake as assigned in 20.6.4.900.H NMAC.*

Table 3. Candidate impairment thresholds from SWQB analyses and literature review

	CAUSAL VARIABLES		RESPONSE VARIABLES			SOURCE	
Lake Group	**TP (mg/L)**	**TN (mg/L)**	**Secchi Depth[a] (m)**	**chl-a^ (µg/L)**	**% Cyano-bacteria**	**Organization/ Author**	**Method of threshold derivation**
COLD candidate thresholds							
NM Coldwater ALU	0.03	0.5	1.5	2.3	-	NMED SWQB	Median of lake group
NM Coldwater ALU	-	-	3	6	21%	NMED SWQB	75th percentile of lake group
NM Coldwater ALU	0.04	0.9	-	-	38%	Scott and Haggard (2011)	Changepoint analysis
ID Mountain	0.015	0.28	-	1.8		ID DEQ	75th percentile of reference
AZ Coldwater	0.70	1.2	1.5-2.0	5-15	>50%	Arizona DEQ	AZ trophic index
mesotrophic-eutrophic boundary	0.030	0.65	2	7.5	-	Nürnberg (1996)	Literature review
WARM candidate thresholds							
Warmwater ALU	0.04	0.6	1	3.2	-	NMED SWQB	Median of lake group
Warmwater ALU	-	-	1.8	10	31%	NMED SWQB	75th percentile of lake group
Warmwater ALU	0.04	1.41	-	-	38%	Scott and Haggard (2011)	Changepoint analysis
ID Xeric	0.048	0.514	-	7.79	-	ID DEQ	75th percentile of reference
AZ Warmwater	0.13	1.7	0.8-1.0	25-40	>50%	Arizona DEQ	AZ trophic index
KS Central Plains & SW Tablelands	0.044	0.70	1.2	11	-	KSU & KS Dept. of Health & Env.	Median of best 1/3
SINKHOLE candidate thresholds							
Sinkhole lakes	0.025	1.42	6	-	-	NMED SWQB	75th percentile of sinkhole lakes
oligotrophic-mesotrophic boundary	0.01	0.35	4	3.5	-	Nürnberg (1996)	Literature review

Secchi depth was included as a separate response variable in the initial lake nutrient assessment protocol (2014) but removed during the 2016 listing cycle. This water clarity measurement is affected by algae, soil particles, as well as other materials suspended in the water. Although Secchi depth can be used as an indicator of algal abundance and general lake productivity, high concentrations of non-algal suspended materials such as clay or organic matter can increase turbidity and weaken the relationship between Secchi depth and chlorophyll production (Lee 1995). If reduced Secchi depth is due to increased algal levels, there should be a concurrent increase in chl-a concentration. Non-algal turbidity is a prominent characteristic of many impoundments in arid Western States (EPA 2000). The amount of non-algal suspended material can be influenced by weather (i.e., rain, strong winds) in the days before sampling. Secchi depth is also influenced by time of day (10 am to 2 pm being ideal), but constraining lake sampling in this way is not possible. Secchi depth will continue to be measured and remains an influential measurement because it is used to estimate the extent of the euphotic zone and thus where to take phytoplankton samples.

3.0 Assessment Procedures

The following parameters are used as indicators in the assessment: nutrient concentrations (TP and TN), chl-a, cyanobacteria, DO, and pH. The interpretation for each set of indicators is given below.

3.1 Total nitrogen and Total phosphorus concentrations

TN is not a 40 CFR Part 136 regulated parameter but is usually taken to mean the sum of Total Kjeldahl Nitrogen (TKN) and Nitrate+Nitrite (NO3+NO2). Therefore, the SWQB typically calculates TN as the sum of TKN plus NO3+NO2 for nutrient assessments. If either TKN or NO3+NO2 is unavailable for a particular sampling event, TN Calculated is noted as a "missing data point" with respect to this listing methodology.

The TKN and NO3+NO2 minimum quantifiable limits, referred to as minimum reported limits or MRLs in SQUID, are added together to determine the "TN Calculated MRL." If either TKN or NO3+NO2 are reported as below the MRL, the respective MRL value is used to determine the TN Calculated value that will be compared against the appropriate threshold. If both TKN and NO3+NO2 are reported as below the MRL, the resultant TN Calculated value is noted as "below the MRL." The respective TP and TN data MRLs for a particular sampling event must be equal to or less than the threshold in order to be useful for assessment.

Compare the TN or TP concentration to the threshold values in Table 2. The information in Table 4 is used to interpret TN and TP data to determine if enrichment is indicated.

Table 4. Interpreting nutrient causal data

TYPE OF DATA*	DOES NOT INDICATE ENRICHMENT	INDICATES ENRICHMENT	NOTES
•**Nutrients** (total nitrogen or total phosphorus) **A)** 4 to 10 samples	**A**) No more than one exceedence of the threshold value.	**A**) More than one exceedence of the threshold value.	Applicable thresholds are found in Table 2.
B) >10 samples	**B**) Threshold value exceeded in < 10% of measurements.	**B**) Threshold value exceeded in ≥ 10% of measurements.	

NOTES: * Less than 4 samples = not assessed. See Section 2.1.4 Main Listing Methodology (CALM) for details.

3.2 Chlorophyll *a* or cyanobacteria

In lakes and reservoirs, phytoplankton community composition and biomass are useful parameters in monitoring changes in water quality. Chl-a concentration is used as a surrogate for phytoplankton biomass and is generally the most appropriate variable to monitor (EPA 2000). Chl-a levels along with Secchi depths and TP are the measurements most commonly used to characterize the trophic status of lakes and reservoirs.

Cyanobacteria (sometimes referred to as blue-green algae) can be toxic under certain conditions and are considered nuisance species (Graham *et al.* 2016). The dominance of cyanobacteria and probability of toxic algal blooms increases with eutrophication (Dodds 2006), so the proportion of these taxa can be a useful indicator to evaluate nutrient loading and nuisance algal growth. The thresholds are expressed as a percentage of the total phytoplankton count and are intended to identify cyanobacteria dominance. The information in Table 5 is used to interpret data from phytoplankton samples and to determine if enrichment is indicated.

Table 5. Interpreting chlorophyll *a* or cyanobacteria response data

TYPE OF DATA	DOES NOT INDICATE ENRICHMENT	INDICATES ENRICHMENT	NOTES
• **Chlorophyll *a* or % cyanobacteria (add conc?)**			
A) 1 sample	A) chl-a concentration or cyanobacteria percentage is less than the applicable threshold value.	A) chl-a concentration or cyanobacteria percentage is greater than the applicable threshold value.	Applicable threshold values for chlorophyll *a* and cyanobacteria are found in Table 2.
B) ≥2 samples	B) Exceedence rate ≤ 10% of measurements, or one or no exceedences of the applicable threshold value.	B) Exceedence rate > 10% of measurements with at least two exceedences of the applicable threshold value.	

3.3 Dissolved oxygen data

DO criteria are based on the designated aquatic life use(s) of as detailed in 20.6.4.900.H NMAC (Table 6). DO measurements taken at intervals are averaged for the epilimnion, or in the absence of an epilimnion, for the upper one-third of the water column of the lake to determine attainment of DO criteria. DO data are assessed following the procedures detailed in the DO Listing Methodology (https://www.env.nm.gov/surface-water-quality/calm/, Appendix E). The information in Table 7 is used to interpret DO data and to determine if nutrient enrichment is indicated.

Table 6. Criteria for dissolved oxygen concentration (20.6.4.900 NMAC)

Aquatic Life Use	DO Criterion*
High Quality Coldwater Coldwater Marginal Coldwater	6.0 mg/L
Coolwater Warmwater Marginal Warmwater	5.0 mg/L

NOTES: * Listing based on data points when concurrently-measured percent saturation was greater than or equal to 90% will be further examined to determine the site-specific reason for the high percent saturation.

Table 7. Interpreting DO response data

TYPE OF DATA	DOES NOT INDICATE ENRICHMENT	INDICATES ENRICHMENT	NOTES
• **DO data**	DO is "Fully Supporting" according to the *Dissolved Oxygen Listing Methodology.**	DO is "Not Supporting" according to the *Dissolved Oxygen Listing Methodology.**	See 20.6.4.14.C(3) NMAC for additional information regarding lake sampling.

NOTES: * Available at https://www.env.nm.gov/surface-water-quality/calm/, Appendix E.

3.4 pH Grab Data

The criteria for pH are based on the designated aquatic life use(s) of as detailed in 20.6.4.900.H NMAC (Table 8). pH measurements taken at intervals are averaged for the epilimnion, or in the absence of an epilimnion, for the upper one-third of the water column of the lake to determine attainment of pH criteria. Data for pH are assessed according to the *pH Listing Methodology* (https://www.env.nm.gov/swqb/protocols/, Appendix F). The information in Table 9 is used to interpret pH data and to determine if enrichment is indicated.

Table 8. Criteria for pH (per 20.6.4.900 NMAC)

Aquatic Life Use	pH Range
High Quality Coldwater Coldwater	6.6 to 8.8
Marginal Coldwater Coolwater Warmwater Marginal Warmwater	6.6. to 9.0

Table 9. Interpreting pH response data

TYPE OF DATA	DOES NOT INDICATE ENRICHMENT	INDICATES ENRICHMENT	NOTES
• **pH data**	pH is "Fully Supporting" according to the *pH Listing Methodology.*.*	pH is "Not Supporting" according to the *pH Listing Methodology.*.*	See 20.6.4.14.C(3) NMAC for additional information regarding lake sampling.

NOTES: * Available at https://www.env.nm.gov/surface-water-quality/calm/, Appendix F.

ANALYSIS AND INTERPRETATION:

The threshold values selected for New Mexico lakes, reservoirs, and sinkholes listed in Table 2 are applied in a weight-of-evidence approach to assess data collected at the deep station. The SWQB strives to collect the full suite of causal and response indicators during nutrient surveys. Occasionally, data may be missing for a particular indicator due to equipment malfunction, sampling complications, or lab analysis errors. While the full suite of parameters must be monitored in order to determine Fully Supporting using this assessment protocol, it is permissible to determine Not Supporting using a partial dataset as detailed below.

Compare each available indicator to the associated impairment threshold using Tables 4 – 9 to determine which variables indicate potential nutrient enrichment. Indicators of nutrient concentrations (TP and TN) are considered causal variables. chl-a, % cyanobacteria, pH and DO indicators are considered response variables.

A lake or reservoir is **Fully Supporting** with respect to New Mexico's narrative nutrient standard if the minimum number of samples with <u>all</u> indicators were collected and no more than one or <10% of samples (whichever is greater) result in 1) one or none of the variables (causal or response variables) indicate enrichment, or (2) total nitrogen or total phosphorus indicate enrichment, but there was no indication of a biological response to elevated nutrients (i.e., no response variables indicate enrichment). A lake or reservoir is **Not Supporting** if the minimum number of samples were collected and more than one or ≥10% of samples (whichever is greater) result in (1) *at least* one causal variable <u>and</u> one response variable indicate enrichment, or (2) if response variable chl-a <u>and</u> another response variable (% cyanobacteria, DO, or pH) indicate enrichment. This second scenario is to account for situations in which the lake is receiving a significant nutrient load, but the nutrients are quickly being assimilated into the biomass of the lake, hence low nutrient concentrations but undesirable effects (refer to example "Lake Two" in Table 10).

When multiple stations exist on a lake or reservoir (e.g., one "shallow" and one "deep" station), they are usually sampled on the same day or within the same seven-day period. The nutrient assessment protocol shall be applied to the shallow and deep station datasets separately.

Figure 2 contains a generalized flowchart for determining nutrient impairment. Table 10 provides some examples of how nutrient assessments will be conducted following these rules.

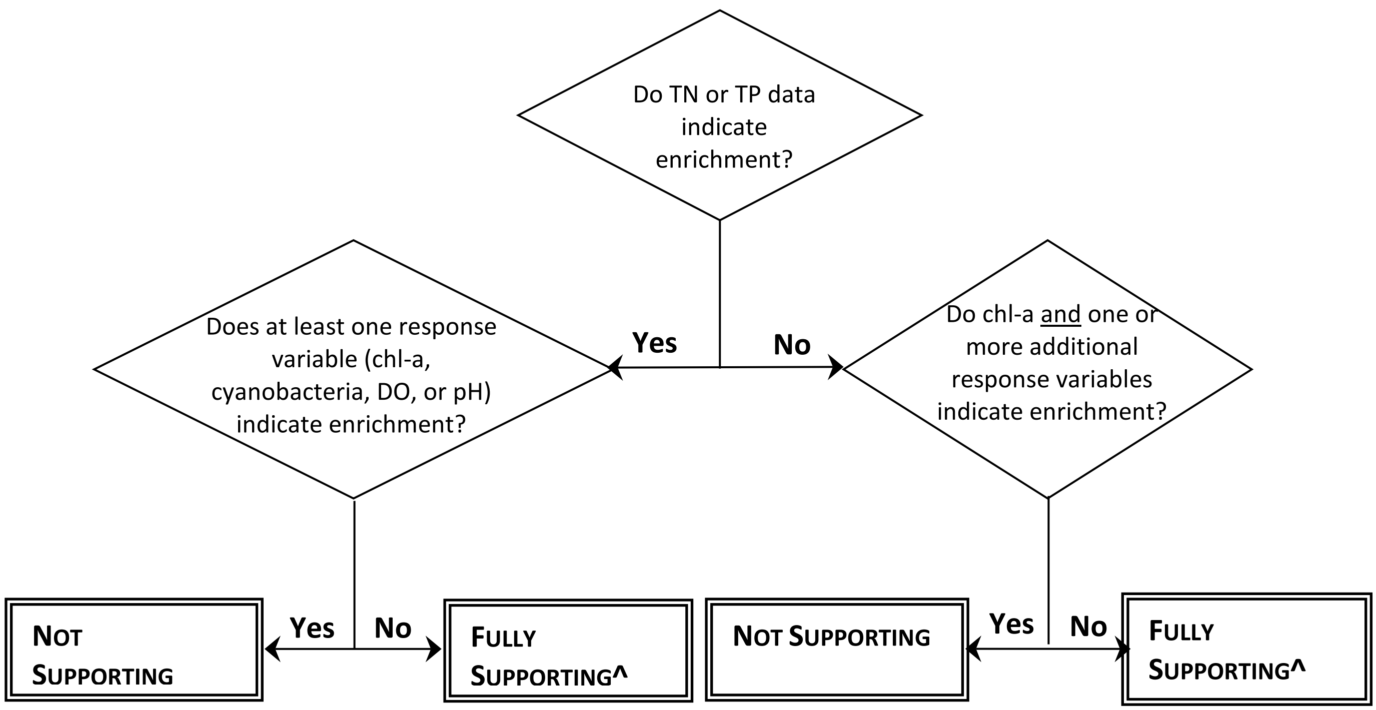

Figure 2. Generalized flowchart for determining nutrient impairment in NM lakes and reservoirs

NOTES: ***Enrichment is determined using Tables 4-9.

^ All indicators must be sampled to determine Fully Supporting.

Table 10. Examples of lake and reservoir nutrient assessments*

Indicators	Lake One *COLD*	Lake Two *COLD*	Lake Three *WARM*	Lake Four *WARM*	Lake Five *SINKHOLE*
TP (mg/L)	0.015	0.03	0.02	**0.051**	**0.032**
TN (mg/L)	0.249	0.45	0.29	**2.06**	**2.69**
Chlorophyll *a* (µg/L)	0.28	**15.4**	**12**	**23**	0.4
% Cyanobacteria	**50**	30	24	5	7.4
DO impairment per DO AP	**Yes^**	**Yes**	No	No	No
pH impairment per pH AP	No	No	No	No	**Yes**
Nutrient Impairment Determination	Full Support^	**Non Support**	Full Support	**Non Support**	**Non Support**

NOTES: *Actual lake nutrient assessments will typically have four to ten values for each indicator. Tables 4 – 9 are used to interpret data. Excursions of the applicable threshold values are **bolded and underlined**.

^In this example, DO would be noted as impaired per the DO Assessment Protocol.

REVISION HISTORY:

2014 listing cycle – **Pre Public Comment**: Original. **Post Public Comment**: Minor edits and clarification to various sections, including DO assessment procedures and lake groups.

2016 listing cycle – Revised to indicate that all indicators must be available to determine Full Support while Non Support can be determined with a partial dataset. Removed application to deep station only. pH added as a response variable. Secchi depth was removed as a specific response variable (see details in Section 2.0). Added alternative Dissolved Inorganic Nitrogen calculation in the absence of useable TKN data.

2018 listing cycle – “Assessment Protocol” changed to “Listing Methodology.” Minor wording clarifications. Addition of 2016 USGS cyanobacteria reference. Removed alternative TN calculation using Dissolved Inorganic Nitrogen in the absence of useable TKN data based on rarity of occurrence and consistency with how missing data are handled in other listing methodologies. Changed Table 4 from “1 to 10” to “2 to 10” because n=2 is a minimum data requirement for assessment (added related footnote).

2020 listing cycle – Website address changes only. Minor wording revisions and clarifications. Increased minimum n from 2 to 4 samples.

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