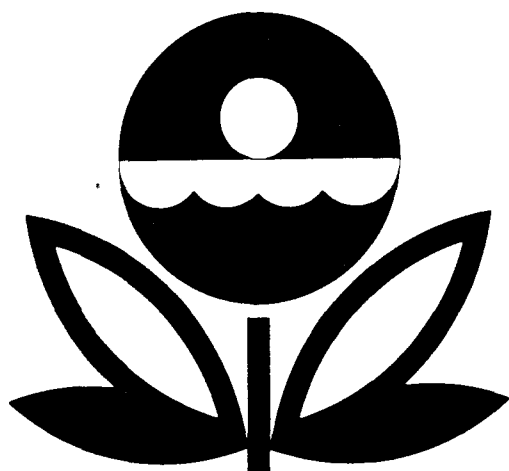


U.S. ENVIRONMENTAL PROTECTION AGENCY
NATIONAL EUTROPHICATION SURVEY
WORKING PAPER SERIES



REPORT
ON
LAKE MEREDITH
HUTCHINSON, MOORE, AND POTTER COUNTIES
TEXAS
EPA REGION VI
WORKING PAPER No. 653

CORVALLIS ENVIRONMENTAL RESEARCH LABORATORY - CORVALLIS, OREGON
and
ENVIRONMENTAL MONITORING & SUPPORT LABORATORY - LAS VEGAS, NEVADA

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F O R E W O R D

The National Eutrophication Survey was initiated in 1972 in response to an Administration commitment to investigate the nation-wide threat of accelerated eutrophication to freshwater lakes and reservoirs.

OBJECTIVES

The Survey was designed to develop, in conjunction with state environmental agencies, information on nutrient sources, concentrations, and impact on selected freshwater lakes as a basis for formulating comprehensive and coordinated national, regional, and state management practices relating to point-source discharge reduction and non-point source pollution abatement in lake watersheds.

ANALYTIC APPROACH

The mathematical and statistical procedures selected for the Survey's eutrophication analysis are based on related concepts that:

- a. A generalized representation or model relating sources, concentrations, and impacts can be constructed.
- b. By applying measurements of relevant parameters associated with lake degradation, the generalized model can be transformed into an operational representation of a lake, its drainage basin, and related nutrients.
- c. With such a transformation, an assessment of the potential for eutrophication control can be made.

LAKE ANALYSIS

In this report, the first stage of evaluation of lake and watershed data collected from the study lake and its drainage basin is documented. The report is formatted to provide state environmental agencies with specific information for basin planning [§303(e)], water quality criteria/standards review [§303(c)], clean lakes [§314(a,b)], and water quality monitoring [§106 and §305(b)] activities mandated by the Federal Water Pollution Control Act Amendments of 1972.

Beyond the single lake analysis, broader based correlations between nutrient concentrations (and loading) and trophic condition are being made to advance the rationale and data base for refinement of nutrient water quality criteria for the Nation's fresh water lakes. Likewise, multivariate evaluations for the relationships between land use, nutrient export, and trophic condition, by lake class or use, are being developed to assist in the formulation of planning guidelines and policies by EPA and to augment plans implementation by the states.

ACKNOWLEDGEMENT

The staff of the National Eutrophication Survey (Office of Research & Development, U. S. Environmental Protection Agency) expresses sincere appreciation to the Texas Water Quality Board for professional involvement, to the Texas National Guard for conducting the tributary sampling phase of the Survey, and to those Texas wastewater treatment plant operators who voluntarily provided effluent samples.

Hugh C. Yantis, Jr., Executive Director of the Texas Water Quality Board, and John B. Latchford, Jr., Director, and the staff of the Field Operations Division provided invaluable lake documentation and counsel during the Survey, reviewed the preliminary reports, and provided critiques most useful in the preparation of this Working Paper series.

Major General Thomas Bishop, the Adjutant General of Texas, and Project Officer Colonel William L. Seals, who directed the volunteer efforts of the Texas National Guardsmen, are also gratefully acknowledged for their assistance to the Survey.

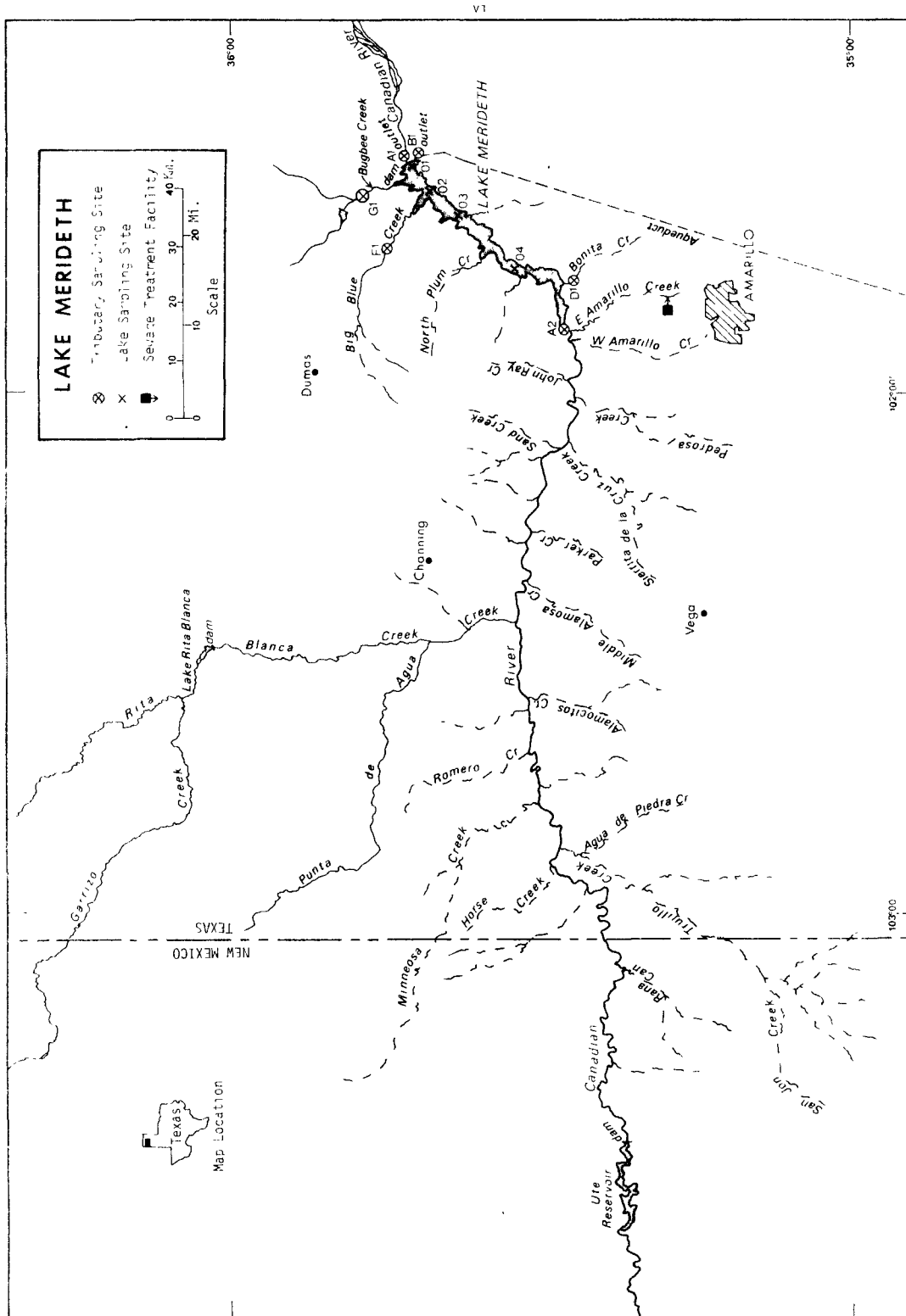
NATIONAL EUTROPHICATION SURVEY

STUDY RESERVOIRS

State of Texas

<u>NAME</u>	<u>COUNTY</u>
Amistad	Val Verde
Bastrop	Bastrop
Belton	Bell, Coryell
Braunig	Bexar
Brownwood	Brown
Buchanan	Burnet, Llano
Caddo	Harrison, Marion, TX; Caddo Parish, LA
Calaveras	Bexar
Canyon	Comal
Colorado City	Mitchell
Corpus Christi	Jim Wells, Live Oak, San Patricio
Diversion	Archer, Baylor
Eagle Mountain	Tarrant, Wise
Fort Phantom Hill	Jones
Houston	Harris
Kemp	Baylor
Lake O'The Pines	Camp, Marion, Morris, Upshur
Lavon	Collin
Lewisville (Garza-Little Elm)	Denton
Livingston	Polk, San Jacinto, Trinity, Walker

Lyndon B. Johnson	Burnet, Llano
Medina	Bandera, Medina
Meredith	Hutchinson, Moore, Potter
O. C. Fisher (San Angelo)	Tom Green
Palestine	Anderson, Cherokee, Henderson, Smith
Possum Kingdom	Palo Pinto, Stephens, Young
Sam Rayburn	Angelina, Jasper Nacogdoches, Sabine, San Augustine
Somerville	Burleson, Lee, Washington
E. V. Spence	Coke
Stamford	Haskell
Stillhouse Hollow	Bell
Tawakoni	Hunt, Rains, Van Zandt
Texoma	Cooke, Grayson TX; Bryan, Johnston, Love, Marshall, OK
Travis	Burnet, Travis
Trinidad	Henderson
Twin Buttes	Tom Green
White River	Crosby
Whitney	Bosque, Hill
Wright Patman (Texarkana)	Bowie, Cass



LAKE MEREDITH
STORET NO. 4823

I. CONCLUSIONS

A. Trophic Condition:

Survey data indicate that Lake Meredith is mesotrophic; i.e., moderately supplied with nutrients and moderately productive. Whether nutrient enrichment is beneficial or deleterious depends on the actual or potential effect on the uses of the reservoir. In this regard, no nuisance conditions are known to personnel of the Texas Water Quality Board and there is little or no impairment of the designated beneficial uses of this water body.

Lake Meredith ranked second in overall trophic quality when the 39 Texas reservoirs sampled in 1974 were compared using a combination of six water quality parameters*. Seven of the water bodies had less median total phosphorus, eleven had less and six had the same median dissolved orthophosphorus, two had less and three had the same median inorganic nitrogen, two had less mean chlorophyll a, and 11 had greater mean Secchi disc transparency. Marked depression of metalimnetic dissolved oxygen occurred at stations 1 and 2 during the August sampling.

Survey limnologists did not observe macrophytes or surface algal concentrations during sampling visits. In a report on a previous study on Lake Meredith, it is noted that aquatic vegetation is not a problem (Kraai, 1974).

* See Appendix A.

B. Rate-Limiting Nutrient:

The algal assay results are not considered representative of conditions in the lake at the times the samples were taken. The lake data indicate nitrogen limitation at all sampling stations in March and October, at station 4 in May, and at stations 1 and 2 in August.

C. Nutrient Controllability:

1. Point sources--The only known point source impacting Lake Meredith during the sampling year was the wastewater treatment plant at Amarillo which accounted for an estimated 28.9% of the total phosphorus load.

The present phosphorus loading of $6.41 \text{ g/m}^2/\text{year}$ is nearly 23 times that proposed by Vollenweider (Vollenweider and Dillon, 1974) as a eutrophic loading (see page 14). However, the lake primarily is nitrogen limited, and this may account for the rather low chlorophyll a levels and the absence of aquatic vegetation problems.

The median inorganic nitrogen concentration in the lake was only $70 \text{ } \mu\text{g/l}$, and it is questionable whether point-source phosphorus control would result in a shift to persistent phosphorus limitation.

2. Non-point sources--During the sampling year, non-point sources contributed 71.1% of the total phosphorus load. The Canadian River contributed 70.8% and three other gaged tributaries collectively contributed less than 1%. The ungaged minor tributaries and immediate drainage were estimated to have contributed less than 1%.

The phosphorus export rate of the Canadian River was much higher than the other tributaries in this drainage basin (see page 12). This may be the result of underestimation of the point-source load contributed by the Amarillo wastewater treatment plant.

II. LAKE AND DRAINAGE BASIN CHARACTERISTICS[†]

A. Lake Morphometry^{††}:

1. Surface area: 66.77 kilometers².
2. Mean depth: 16.0 meters.
3. Maximum depth: >26.2 meters.
4. Volume: 1,066.229 x 10⁶ m³.
5. Mean hydraulic retention time: 8.6 years.

B. Tributary and Outlet: (See Appendix C for flow data)

1. Tributaries -

<u>Name</u>	<u>Drainage area (km²)^{†††}</u>	<u>Mean flow (m³/sec)^{†††}</u>
Canadian River	39,823.8	6.290
Bonita Creek	166.8	0.057
Big Blue Creek	665.6	0.253
Bugbee Creek	19.7	0.005
Minor tributaries & immediate drainage -	<u>821.6</u>	<u>0.279</u>
Totals	41,497.5	6.884

2. Outlet -

Aqueduct	-	2.778*
Canadian River	<u>41,564.3</u>	<u>1.170</u>
Total	41,564.3**	3.948

C. Precipitation^{***}:

1. Year of sampling: 58.6 centimeters.
2. Mean annual: 51.5 centimeters.

† Table of metric conversions--Appendix B.

†† At conservation pool level; Williams, 1976.

††† For limits of accuracy, see Working Paper No. 175, "...Survey Methods, 1973-1976".

* Anonymous, 1975.

** Includes area of lake.

*** See Working Paper No. 175.

III. LAKE WATER QUALITY SUMMARY

Lake Meredith was sampled four times in 1974 by means of a pontoon-equipped Huey helicopter. Each time, samples for physical and chemical parameters were collected from a number of depths at four stations on the lake (see map, page vi). During each visit, a single depth-integrated (4.6 m to surface) sample was composited from the stations for phytoplankton identification and enumeration; and during the first and last visits, a single 18.9-liter depth-integrated sample was composited for algal assays. Also each time, a depth-integrated sample was collected from each of the stations for chlorophyll a analysis. The maximum depths sampled were 26.2 meters at station 1, 21.9 meters at station 2, 14.0 meters at station 3, and 9.1 meters at station 4.

The sampling results are presented in full in Appendix D and are summarized in the following table.

A. SUMMARY OF PHYSICAL AND CHEMICAL CHARACTERISTICS FOR LAKE MEREDITH
STOKET CODE 4823

PARAMETER	1ST SAMPLING (3/ 5/74)				2ND SAMPLING (5/14/74)				3RD SAMPLING (8/ 7/74)			
	4 SITES				4 SITES				4 SITES			
	RANGE	MEAN	MEDIAN		RANGE	MEAN	MEDIAN		RANGE	MEAN	MEDIAN	
TEMP (C)	5.4 - 7.8	6.1	5.8		16.4 - 18.7	17.7	17.5		21.7 - 24.7	23.8	24.0	
DISS OXY (MG/L)	6.0 - 10.6	10.0	10.3		7.4 - 8.0	7.7	7.8		0.1 - 7.2	5.0	5.8	
CNDCTVY (MCROMO)	1120. - 1200.	1147.	1138.		1432. - 1586.	1520.	1535.		1757. - 1894.	1855.	1863.	
PH (STAND UNITS)	8.3 - 8.6	8.6	8.6		8.1 - 8.4	8.3	8.3		7.3 - 8.4	7.7	7.7	
TOT ALK (MG/L)	195. - 200.	198.	198.		185. - 192.	188.	188.		180. - 196.	188.	186.	
TOT P (MG/L)	0.008 - 0.037	0.015	0.012		0.020 - 0.144	0.037	0.029		0.019 - 0.064	0.034	0.027	
ORTHO P (MG/L)	0.006 - 0.015	0.010	0.009		0.004 - 0.013	0.008	0.008		0.002 - 0.036	0.011	0.005	
NO2+NO3 (MG/L)	0.020 - 0.050	0.035	0.030		0.030 - 0.140	0.068	0.070		0.020 - 0.140	0.055	0.040	
AMMONIA (MG/L)	0.020 - 0.040	0.032	0.030		0.040 - 0.090	0.061	0.060		0.020 - 0.150	0.057	0.050	
KJEL N (MG/L)	0.300 - 0.700	0.450	0.400		0.200 - 0.500	0.335	0.300		0.300 - 0.600	0.400	0.400	
INORG N (MG/L)	0.040 - 0.090	0.067	0.065		0.070 - 0.230	0.129	0.130		0.040 - 0.240	0.112	0.080	
TOTAL N (MG/L)	0.340 - 0.730	0.485	0.440		0.270 - 0.580	0.404	0.370		0.320 - 0.720	0.455	0.430	
CHLORPHYL A (UG/L)	0.7 - 1.9	1.2	1.2		1.2 - 6.0	2.8	2.1		0.2 - 4.3	2.7	3.2	
SECCHI (METERS)	1.5 - 3.1	2.2	2.1		0.4 - 2.2	1.3	1.3		1.3 - 2.4	1.8	1.7	

A. SUMMARY OF PHYSICAL AND CHEMICAL CHARACTERISTICS FOR LAKE MEREDITH
STORET CODE 4823

4TH SAMPLING (10/28/74)

PARAMETER	RANGE	4 SITES MEAN	MEDIAN
TEMP (C)	14.8 - 17.0	16.5	16.8
DISS OXY (MG/L)	7.6 - 8.6	8.0	8.0
CNDCTVY (MCROMO)	1388. - 1563.	1528.	1557.
PH (STAND UNITS)	8.3 - 8.6	8.5	8.5
TOT ALK (MG/L)	165. - 177.	173.	174.
TOT P (MG/L)	0.014 - 0.086	0.030	0.023
ORTHO P (MG/L)	0.007 - 0.029	0.014	0.012
NO2+NO3 (MG/L)	0.020 - 0.130	0.036	0.020
AMMONIA (MG/L)	0.020 - 0.040	0.026	0.030
KJEL N (MG/L)	0.400 - 0.700	0.485	0.500
INORG N (MG/L)	0.040 - 0.160	0.062	0.050
TOTAL N (MG/L)	0.420 - 0.720	0.521	0.520
CHLOROPHYL A (UG/L)	3.2 - 9.7	5.3	4.2
SECCHI (METERS)	0.4 - 1.2	0.8	0.9

B. Biological characteristics:

1. Phytoplankton* -

<u>Sampling Date</u>	<u>Dominant Genera</u>	<u>Algal Units per ml</u>
03/05/74	1. <u>Chroomonas</u> sp.	734
	2. <u>Oocystis</u> sp.	341
	3. <u>Flagellates</u>	262
	4. <u>Cryptomonas</u> sp.	105
	5. <u>Stephanodiscus</u> sp.	52
	Other genera	<u>105</u>
	Total	1,599
05/14/74	1. <u>Oocystis</u> sp.	801
	2. <u>Nitzschia</u> sp.	615
	3. <u>Binuclearia</u> sp.	476
	4. <u>Chroomonas</u> sp.	450
	5. <u>Stephanodiscus</u> sp.	316
	Other genera	<u>530</u>
	Total	3,188
08/07/74	1. <u>Chroomonas</u> sp.	286
	2. <u>Cryptomonas</u> sp.	82
	3. <u>Coelastrum</u> sp.	41
	4. <u>Microcystis</u> sp.	20
	5. <u>Oocystis</u> sp.	20
	Other genera	<u>62</u>
	Total	511

* The October phytoplankton sample was lost in shipment.

2. Chlorophyll a -

<u>Sampling Date</u>	<u>Station Number</u>	<u>Chlorophyll <u>a</u> ($\mu\text{g/l}$)</u>
03/05/74	1	0.7
	2	1.0
	3	1.4
	4	1.9
05/14/74	1	1.5
	2	1.2
	3	2.7
	4	6.0
08/07/74	1	2.4
	2	0.2
	3	4.3
	4	4.0
10/28/74	1	3.2
	2	3.8
	3	4.6
	4	9.7

C. Limiting Nutrient Study:

The algal assay results are not considered representative of conditions in the lake at the times the samples were collected (03/05/74 and 10/28/74) due to significant changes in nitrogen and phosphorus in the samples during shipment from the field to the laboratory.

The lake data indicate nitrogen was limiting in March and October. However, at the other two sampling times, a combination of limiting nutrients is indicated. Following is a tabulation of

the mean inorganic nitrogen/orthophosphorus ratios for each of the sampling stations and times with the indicated limiting nutrient in parentheses.

<u>Station</u>	<u>03/05/74</u>	<u>05/04/74</u>	<u>08/07/74</u>	<u>10/28/74</u>
1	8/1 (N)	20/1 (P)	9/1 (N)	4/1 (N)
2	8/1 (N)	16/1 (P)	8/1 (N)	4/1 (N)
3	7/1 (N)	18/1 (P)	26/1 (P)	3/1 (N)
4	5/1 (N)	12/1 (N)	32/1 (P)	5/1 (N)

IV. NUTRIENT LOADINGS (See Appendix E for data)

For the determination of nutrient loadings, the Texas National Guard collected monthly near-surface grab samples from each of the tributary sites indicated on the map (page vi), except for the high runoff month of May when two samples were collected. Sampling was begun in September, 1974, and was completed in August, 1975.

Through an interagency agreement, stream flow estimates for the year of sampling and a "normalized" or average year were provided by the Texas District Office of the U.S. Geological Survey for the tributary sites nearest the lake.

In this report, nutrient loads for sampled tributaries, including the aqueduct, were calculated using mean annual concentrations and mean annual flows. Nutrient loads shown are those measured minus point-source loads, if any.

Nutrient loads for unsampled "minor tributaries and immediate drainage" ("ZZ" of U.S.G.S.) were estimated using the mean concentrations in Big Blue Creek at station F-1 and the mean annual ZZ flow.

The operator of the Amarillo wastewater treatment plant did not participate. Therefore, nutrient loads were estimated at 1.134 kg P and 3.401 kg N/capita/year, and flows were estimated at 0.3785 m³/capita/day.

A. Waste Sources:

1. Known municipal* -

<u>Name</u>	<u>Pop. Served</u>	<u>Treatment</u>	<u>Mean Flow (m³/d)</u>	<u>Receiving Water</u>
Amarillo - North	109,000	act. sludge	41,256.5	East Creek

2. Industrial - Unknown

B. Annual Total Phosphorus Loading - Average Year:

1. Inputs -

<u>Source</u>	<u>kg P/ yr</u>	<u>% of total</u>
a. Tributaries (non-point load) -		
Canadian River	302,870	70.8
Bonita Creek	35	<0.1
Big Blue Creek	130	<0.1
Bugbee Creek	5	<0.1
b. Minor tributaries & immediate drainage (non-point load) -	140	<0.1
c. Known municipal STP's -		
Amarillo	123,605	28.9
d. Septic tanks - None	-	-
e. Industrial - Unknown	?	-
f. Direct precipitation** -	<u>1,170</u>	<u>0.3</u>
Total	427,955	100.0

2. Outputs -

Lake outlet - Aqueduct	1,400
Canadian River	<u>480</u>
Total	1,880

3. Net annual P accumulation - 426,075 kg.

* Wyatt, 1976.

** See Working Paper No. 175.

C. Annual Total Nitrogen Loading - Average Year:

1. Inputs -

<u>Source</u>	<u>kg N/ yr</u>	<u>% of total</u>
a. Tributaries (non-point load) -		
Canadian River	1,175,510	72.2
Bonita Creek	1,070	<0.1
Big Blue Creek	4,555	0.3
Bugbee Creek	115	<0.1
b. Minor tributaries & immediate drainage (non-point load) -	5,025	0.3
c. Known municipal STP's -		
Amarillo	370,710	22.8
d. Septic tanks - None	-	-
e. Industrial - Unknown	?	-
f. Direct precipitation* -	<u>72,085</u>	<u>4.4</u>
Total	1,629,070	100.0

2. Outputs -

Lake outlet - Aqueduct	56,070
Canadian River	<u>19,115</u>
Total	75,185

3. Net annual N accumulation - 1,553,885 kg.

D. Non-point Nutrient Export by Subdrainage Area:

<u>Tributary</u>	<u>kg P/km²/yr</u>	<u>kg N/km²/yr</u>
Canadian River	8	30
Bonita Creek	<1	6
Big Blue Creek	<1	7
Bugbee Creek	<1	6

* See Working Paper No. 175.

E. Yearly Loads:

In the following table, the existing phosphorus loadings are compared to those proposed by Vollenweider (Vollenweider and Dillon, 1974). Essentially, his "dangerous" loading is one at which the receiving water would become eutrophic or remain eutrophic; his "permissible" loading is that which would result in the receiving water remaining oligotrophic or becoming oligotrophic if morphometry permitted. A mesotrophic loading would be considered one between "dangerous" and "permissible".

Note that Vollenweider's model may not be applicable to water bodies with short hydraulic retention times.

	Total Phosphorus		Total Nitrogen	
	Total	Accumulated	Total	Accumulated
grams/m ² /yr	6.41	6.38	24.4	23.3

Vollenweider phosphorus loadings
(g/m²/yr) based on mean depth and mean
hydraulic retention time of Lake Meredith:

"Dangerous" (eutrophic loading)	0.28
"Permissible" (oligotrophic loading)	0.14

V. LITERATURE REVIEWED

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VI. APPENDICES

APPENDIX A

LAKE RANKINGS

LAKE DATA TO BE USED IN RANKINGS

LAKE CODE	LAKE NAME	MEDIAN TOTAL P	MEDIAN INORG N	500- MEAN SEC	MEAN CHLORA	15- MIN DO	MEDIAN DISS ORTHO P
4801	AMISTAD LAKE	0.013	0.500	371.474	2.042	14.900	0.009
4802	BASTROP LAKE	0.022	0.090	419.917	12.392	15.000	0.007
4803	BELTON RESERVOIR	0.016	0.185	378.312	8.025	15.000	0.007
4804	BRAUNIG LAKE	0.134	0.150	461.625	22.762	14.800	0.062
4805	BROWNWOOD LAKE	0.027	0.100	470.375	4.887	14.400	0.007
4806	LAKE BUCHANAN	0.036	0.250	437.625	8.606	15.000	0.012
4807	CADDO LAKE	0.055	0.070	463.333	14.808	11.400	0.013
4808	CALAVERAS LAKE	0.038	0.060	461.667	22.500	13.000	0.007
4809	CANYON RESERVOIR	0.010	0.450	384.812	2.500	14.800	0.006
4810	LAKE COLORADO CITY	0.042	0.090	473.625	12.675	10.200	0.012
4811	CORPUS CRISTI LAKE	0.113	0.130	475.187	19.756	14.000	0.050
4812	DIVERSION LAKE	0.025	0.080	470.111	15.867	9.000	0.009
4813	EAGLE MOUNTAIN LAKE	0.024	0.070	469.625	5.662	11.000	0.008
4814	FT PHANTOM HILL LAKE	0.060	0.105	474.909	6.317	9.800	0.022
4815	GARZA LITTLE ELM RESERVO	0.045	0.380	475.782	14.156	14.600	0.018
4816	KEMP LAKE	0.023	0.110	455.000	10.217	10.400	0.007
4817	HOUSTON LAKE	0.097	0.260	486.187	16.650	12.400	0.036
4818	LAKE OF THE PINES	0.031	0.090	440.000	12.919	15.000	0.011
4819	LAVON RESERVOIR	0.063	0.180	485.333	5.400	8.800	0.018
4820	LIVINGSTON LAKE	0.196	0.555	465.469	16.112	15.000	0.128
4821	LYNDON B JOHNSON LAKE	0.042	0.420	456.500	8.100	14.900	0.013
4822	MEDINA LAKE	0.010	0.600	403.562	12.944	15.000	0.004
4823	LAKE MEREDITH	0.021	0.070	439.312	3.037	14.900	0.009
4824	PALESTINE LAKE	0.031	0.180	442.625	10.619	14.800	0.010
4825	POSSUM KINGDOM RESERVOIR	0.023	0.070	419.045	9.495	15.000	0.009
4826	SAN ANGELO RESERVOIR	0.098	0.140	481.000	24.675	10.200	0.011
4827	SAM RAYBURN RESERVOIR	0.029	0.150	439.458	6.267	15.000	0.009
4828	E V SPENCE RESERVOIR	0.036	0.080	462.583	11.775	15.000	0.008

LAKE DATA TO BE USED IN RANKINGS

LAKE CODE	LAKE NAME	MEDIAN TOTAL P	MEDIAN INORG N	500- MEAN SEC	MEAN CHLORA	15- MIN DO	MEDIAN DISS ORTHO P
4829	SOMERVILLE LAKE	0.053	0.115	473.833	24.491	13.000	0.015
4830	STAMFORD LAKE	0.073	0.060	482.714	18.457	10.600	0.012
4831	STILLHOUSE HOLLOW RESERV	0.018	0.160	406.250	3.917	15.000	0.010
4832	TAWAKONI LAKE	0.046	0.100	466.417	18.246	13.200	0.013
4833	TEXARKANA LAKE	0.106	0.120	478.500	19.119	12.400	0.030
4834	TEXOMA LAKE	0.042	0.160	451.321	12.493	15.000	0.018
4835	TRAVIS LAKE	0.018	0.250	389.913	5.595	15.000	0.007
4836	TRINIDAD	0.389	0.110	479.500	24.300	10.000	0.240
4837	TWIN BUTTES RESERVOIR	0.029	0.250	454.917	8.708	14.800	0.009
4838	WHITE RIVER RESERVOIR	0.020	0.110	434.500	4.333	15.000	0.009
4839	WHITNEY LAKE	0.028	0.120	430.500	6.912	15.000	0.008

PERCENT OF LAKES WITH HIGHER VALUES (NUMBER OF LAKES WITH HIGHER VALUES)

LAKE CODE	LAKE NAME	MEDIAN TOTAL P	MEDIAN INORG N	500- MEAN SEC	MEAN CHLORA	15- MIN DO	MEDIAN DISS OTHU P	INDEX NO
4801	AMISTAD LAKE	95 (36)	5 (2)	100 (38)	100 (38)	39 (14)	63 (21)	402
4802	HASTROP LAKE	79 (30)	76 (28)	82 (31)	47 (18)	17 (0)	92 (34)	393
4803	BELTON RESERVOIR	92 (35)	26 (10)	97 (37)	68 (26)	17 (0)	84 (31)	384
4804	BRAUNIG LAKE	5 (2)	42 (16)	50 (19)	8 (3)	49 (17)	5 (2)	159
4805	BROWNWOOD LAKE	66 (25)	70 (26)	29 (11)	87 (33)	58 (22)	84 (31)	394
4806	LAKE BUCHANAN	47 (18)	21 (7)	74 (28)	63 (24)	17 (0)	39 (14)	261
4807	CADDO LAKE	26 (10)	91 (33)	42 (16)	32 (12)	76 (29)	30 (10)	297
4808	CALAVERAS LAKE	45 (17)	100 (38)	47 (18)	11 (4)	67 (25)	92 (34)	362
4809	CANYON RESERVOIR	99 (37)	8 (3)	95 (36)	97 (37)	49 (17)	97 (37)	445
4810	LAKE COLORADO CITY	39 (14)	76 (28)	26 (10)	42 (16)	88 (33)	39 (14)	310
4811	CORPUS CRISTI LAKE	8 (3)	47 (18)	18 (7)	13 (5)	61 (23)	8 (3)	155
4812	DIVERSION LAKE	68 (26)	83 (31)	32 (12)	29 (11)	97 (37)	63 (21)	372
4813	EAGLE MOUNTAIN LAKE	71 (27)	91 (33)	34 (13)	79 (30)	79 (30)	76 (28)	430
4814	FT PHANTOM HILL LAKE	24 (9)	66 (25)	21 (8)	74 (28)	95 (36)	16 (6)	296
4815	GARZA LITTLE ELM RESERVO	34 (13)	13 (5)	16 (6)	34 (13)	55 (21)	21 (7)	173
4816	KEMP LAKE	76 (29)	61 (22)	55 (21)	55 (21)	84 (32)	92 (34)	423
4817	HOUSTON LAKE	16 (6)	16 (6)	0 (0)	24 (9)	72 (27)	11 (4)	139
4818	LAKE OF THE PINES	54 (20)	76 (28)	66 (25)	39 (15)	17 (0)	46 (17)	298
4819	LAVON RESERVOIR	21 (8)	29 (11)	3 (1)	84 (32)	100 (38)	21 (7)	258
4820	LIVINGSTON LAKE	3 (1)	3 (1)	39 (15)	26 (10)	17 (0)	3 (1)	91
4821	LYNDON B JOHNSON LAKE	39 (14)	11 (4)	53 (20)	66 (25)	39 (14)	30 (10)	238
4822	MEDINA LAKE	99 (37)	0 (0)	89 (34)	37 (14)	17 (0)	100 (38)	342
4823	LAKE MEREDITH	82 (31)	91 (33)	71 (27)	95 (36)	39 (14)	63 (21)	441
4824	PALESTINE LAKE	54 (20)	32 (12)	63 (24)	53 (20)	49 (17)	51 (19)	302
4825	POSSUM KINGDOM RESERVOIR	74 (28)	91 (33)	84 (32)	58 (22)	17 (0)	63 (21)	387
4826	SAN ANGELO RESERVOIR	13 (5)	45 (17)	8 (3)	0 (0)	88 (33)	46 (17)	200
4827	SAM RAYBURN RESERVOIR	59 (22)	39 (15)	68 (26)	76 (29)	17 (0)	63 (21)	322
4828	E V SPENCE RESERVOIR	50 (19)	83 (31)	45 (17)	50 (19)	17 (0)	76 (28)	321

PERCENT OF LAKES WITH HIGHER VALUES (NUMBER OF LAKES WITH HIGHER VALUES)

LAKE CODE	LAKE NAME	MEDIAN TOTAL P	MEDIAN INORG N	500- MEAN SEC	MEAN CHLORA	15- MIN DO	MEDIAN DISS ORTHO P	INDEX NO
4829	SOMERVILLE LAKE	29 (11)	55 (21)	24 (9)	3 (1)	67 (25)	30 (10)	208
4830	STAMFORD LAKE	18 (7)	97 (37)	5 (2)	18 (7)	82 (31)	39 (14)	259
4831	STILLHOUSE HOLLOW RESERV	88 (33)	37 (14)	87 (33)	92 (35)	17 (0)	51 (19)	372
4832	TAWAKONI LAKE	32 (12)	70 (26)	37 (14)	21 (8)	63 (24)	30 (10)	253
4833	TEXARKANA LAKE	11 (4)	51 (19)	13 (5)	16 (6)	72 (27)	13 (5)	176
4834	TEXOMA LAKE	39 (14)	34 (13)	61 (23)	45 (17)	17 (0)	21 (7)	217
4835	TRAVIS LAKE	88 (33)	21 (7)	92 (35)	82 (31)	17 (0)	84 (31)	384
4836	TRINIDAD	0 (0)	61 (22)	11 (4)	5 (2)	92 (35)	0 (0)	169
4837	TWIN BUTTES RESERVOIR	59 (22)	21 (7)	58 (22)	61 (23)	49 (17)	63 (21)	311
4838	WHITE RIVER RESERVOIR	84 (32)	61 (22)	76 (29)	89 (34)	17 (0)	63 (21)	390
4839	WHITNEY LAKE	63 (24)	51 (19)	79 (30)	71 (27)	17 (0)	76 (28)	357

LAKES RANKED BY INDEX NOS.

RANK	LAKE CODE	LAKE NAME	INDEX NO
1	4809	CANYON RESERVOIR	445
2	4823	LAKE MEREDITH	441
3	4813	EAGLE MOUNTAIN LAKE	430
4	4816	KEMP LAKE	423
5	4801	AMISTAD LAKE	402
6	4805	BROWNWOOD LAKE	394
7	4802	BASTROP LAKE	393
8	4838	WHITE RIVER RESERVOIR	390
9	4825	POSSUM KINGDOM RESERVOIR	387
10	4835	TRAVIS LAKE	384
11	4803	BELTON RESERVOIR	384
12	4831	STILLHOUSE HOLLOW RESERV	372
13	4812	DIVERSION LAKE	372
14	4808	CALAVERAS LAKE	362
15	4839	WHITNEY LAKE	357
16	4822	MEDINA LAKE	342
17	4827	SAM RAYBURN RESERVOIR	322
18	4828	E V SPENCE RESERVOIR	321
19	4837	TWIN BUTTES RESERVOIR	311
20	4810	LAKE COLORADO CITY	310
21	4824	PALESTINE LAKE	302
22	4818	LAKE OF THE PINES	298
23	4807	CADDO LAKE	297
24	4814	FT PHANTOM HILL LAKE	296
25	4806	LAKE BUCHANAN	261
26	4830	STAMFORD LAKE	259
27	4819	LAVON RESERVOIR	258
28	4832	TAWAKONI LAKE	253

LAKES RANKED BY INDEX NOS.

RANK	LAKE CODE	LAKE NAME	INDEX NO
29	4821	LYNDON B JOHNSON LAKE	238
30	4834	TEXOMA LAKE	217
31	4829	SOMERVILLE LAKE	208
32	4826	SAN ANGELO RESERVOIR	200
33	4833	TEXARKANA LAKE	176
34	4815	GARZA LITTLE ELM RESERVO	173
35	4836	TRINIDAD	169
36	4804	BRAUNIG LAKE	159
37	4811	CORPUS CRISTI LAKE	155
38	4817	HOUSTON LAKE	139
39	4820	LIVINGSTON LAKE	91

APPENDIX B

CONVERSION FACTORS

CONVERSION FACTORS

Hectares x 2.471 = acres

Kilometers x 0.6214 = miles

Meters x 3.281 = feet

Cubic meters x 8.107×10^{-4} = acre/feet

Square kilometers x 0.3861 = square miles

Cubic meters/sec x 35.315 = cubic feet/sec

Centimeters x 0.3937 = inches

Kilograms x 2.205 = pounds

Kilograms/square kilometer x 5.711 = lbs/square mile

APPENDIX C

TRIBUTARY FLOW DATA

TRIBUTARY FLOW INFORMATION FOR TEXAS

06/10/76

LAKE CODE 4823 MEREDITH

TOTAL DRAINAGE AREA OF LAKE(SQ KM) 41564.3

TRIBUTARY	SUB-DRAINAGE AREA(SQ KM)	NORMALIZED FLOWS(CMS)											
		JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP	OCT	NOV	DEC
4823A1	41564.3	1.59	1.87	1.93	0.82	1.44	0.82	0.76	0.91	1.42	0.34	0.82	1.39
4823A2	39823.8	0.99	0.88	1.16	3.03	4.42	16.99	14.61	13.76	11.78	4.28	2.49	0.91
4823B1	166.8	0.003	0.003	0.006	0.014	0.147	0.142	0.059	0.130	0.031	0.105	0.008	0.028
4823F1	665.6	0.011	0.011	0.020	0.068	0.680	0.651	0.269	0.538	0.159	0.425	0.037	0.142
4823G1	19.7	0.000	0.000	0.001	0.001	0.014	0.014	0.006	0.003	0.003	0.011	0.001	0.003
4823Z2	888.4	0.023	0.020	0.025	0.099	0.680	0.680	0.396	0.510	0.249	0.481	0.045	0.119
													0.279

SUMMARY

TOTAL DRAINAGE AREA OF LAKE = 41564.3
 SUM OF SUB-DRAINAGE AREAS = 41564.3
 TOTAL FLOW IN = 82.37
 TOTAL FLOW OUT = 14.10

MEAN MONTHLY FLOWS AND DAILY FLOWS(CMS)

TRIBUTARY	MONTH	YEAR	MEAN FLOW	DAY	FLOW	DAY	FLOW
4823A1	9	74	0.014	7	0.014		
	10	74	0.014	4	0.014		
	11	74	0.014	13	0.014		
	12	74	0.014	16	0.014		
	1	75	0.014	10	0.014		
	2	75	0.014	10	0.014		
	3	75	0.014	7	0.014		
	4	75	0.014	4	0.014		
	5	75	0.014	5	0.014	27	0.014
	6	75	0.014	17	0.014		
	7	75	0.014	4	0.014		
	8	75	0.014	12	0.014		
4823A2	9	74	9.033	7	2.549		
	10	74	12.290	7	1.501		
	11	74	1.727	7	2.294		
	12	74	0.765	13	0.850		
	1	75	1.812	7	2.662		
	2	75	1.982	7	1.642		
	3	75	0.850	10	1.161		
	4	75	0.283	4	0.227		
	5	75	0.566	7	0.283	23	1.104
	6	75	15.093	17	1.671		
	7	75	3.200	7	0.991		
	8	75	3.681	12	0.396		

TRIBUTARY FLOW INFORMATION FOR TEXAS

06/10/76

LAKE CODE 4823 MEREDITH

MEAN MONTHLY FLOWS AND DAILY FLOWS(CMS)

TRIBUTARY	MONTH	YEAR	MEAN FLOW	DAY	FLOW	DAY	FLOW	DAY	FLOW
4823D1	9	74	0.034	7	0.034				
	10	74	0.042	7	0.042				
	11	74	0.051	13	0.051				
	12	74	0.057	9	0.057				
	1	75	0.057	7	0.057				
	2	75	0.057	7	0.057				
	3	75	0.057	18	0.057				
	4	75	0.057	4	0.057				
	5	75	0.057	7	0.057	23	0.057		
	6	75	0.057	17	0.057				
	7	75	0.042	7	0.042				
	8	75	0.028	12	0.028				
4823F1	9	74	0.057	7	0.057				
	10	74	0.085	4	0.085				
	11	74	0.113	13	0.113				
	12	74	0.142	16	0.142				
	1	75	0.142	10	0.142				
	2	75	0.142	10	0.142				
	3	75	0.113	18	0.113				
	4	75	0.113	4	0.113				
	5	75	0.113	5	0.113	27	0.113		
	6	75	0.113	19	0.113				
	7	75	0.057	4	0.057				
	8	75	0.028						
4823G1	9	74	0.028	7	0.028				
	10	74	0.028	4	0.028				
	11	74	0.028	13	0.028				
	12	74	0.028	16	0.028				
	1	75	0.028	10	0.028				
	2	75	0.028	10	0.028				
	3	75	0.028	18	0.028				
	4	75	0.028	4	0.028				
	5	75	0.028	5	0.028	27	0.028		
	6	75	0.028	19	0.028				
	7	75	0.028	4	0.028				
	8	75	0.028	12	0.028				
4823ZZ	9	74	0.0						
	10	74	0.0						
	11	74	0.0						
	12	74	0.0						
	1	75	0.0						
	2	75	2.067						
	3	75	0.0						
	4	75	0.0						
	5	75	0.0						
	6	75	0.396						
	7	75	88.632						
	8	75	0.0						

APPENDIX D

PHYSICAL and CHEMICAL DATA

482301
35 42 35.0 101 33 08.0
LAKE MEREDITH
48233 TEXAS

			11EPALES			2111202						
			3			0090 FEET			DEPTH			
DATE FROM TO	TIME OF DAY	DEPTH FEET	WATER TEMP CENT	00300 DO MG/L	00077 TRANSP SECCHI INCHES	00094 CONDUCTVY FIELD MICROMHO	00400 PH	00410 T ALK CACO3 MG/L	00610 NH3-N TOTAL MG/L	00625 TOT KJEL N MG/L	00630 N-TOTAL MG/L	00671 PHOS-UIS URTHU MG/L P
74/03/05	14 20 0000		5.8		122	1140	8.30	195	0.030	0.500	0.050	0.009
	14 20 0005		5.7	10.6		1130	8.50	195	0.030	0.400	0.040	0.009
	14 20 0015		5.7	10.4		1120	8.60	196	0.030	0.400	0.030	0.010
	14 20 0030		5.6	10.4		1130	8.60	198	0.030	0.400	0.030	0.009
74/05/14	14 20 0060		5.8			1130	8.60	198	0.030	0.400	0.030	0.006
	14 20 0086		5.4		85	1130	8.60	197	0.030	0.400	0.030	0.006
	14 40 0000		18.3	10.2		1565	8.30	186	0.070	0.500	0.080	0.007
	14 40 0005		18.0			1466	8.30	185	0.060	0.300	0.070	0.006
74/08/07	14 40 0017		17.5	8.0		1450	8.30	186	0.040	0.300	0.030	0.004
	14 40 0050		17.2	7.4		1438	8.10	186	0.060	0.300	0.060	0.006
	14 40 0076		16.4	7.4		1432	8.30	188	0.070	0.400	0.080	0.008
	12 55 0000		24.3	6.2	96	1880	8.40	193	0.040	0.500	0.040	0.014
74/08/07	12 55 0020		24.2	6.2		1873	8.00	191	0.030	0.300	0.020	0.002K
	12 55 0035		24.0	5.8		1863	7.90	193	0.050	0.300	0.040	0.005
	12 55 0050		23.8	4.4		1855	7.60	186	0.060	0.300	0.130	0.013
	12 55 0070		23.0	3.0		1820	7.60	188	0.050	0.300	0.120	0.025
74/10/28	12 55 0075		21.7	0.1		1757	7.50	195	0.150	0.400	0.070	0.036
	08 30 0000		17.0	7.8	49	1563	8.43	174	0.030	0.500	0.020K	0.013
	08 30 0005		17.0	7.6		1563	8.43	174	0.030	0.400	0.020K	0.013
	08 30 0020		17.0	7.6		1563	8.37	175	0.030	0.500	0.020K	0.013
	08 30 0040		17.0	7.8		1563	8.36	172	0.020	0.500	0.020K	0.007
	08 30 0060		17.0	7.6		1561	8.31	175	0.030	0.400	0.020K	0.011
	08 30 0083		16.9	7.8		1560	8.29	175	0.030	0.400	0.020K	0.012

K VALUE KNOWN TO BE
LESS THAN INDICATED

STOKET RETRIEVAL DATE 76/02/11

4x2301
35 42 35.0 101 33 08.0
LAKE MEREDITH
48233 TEXAS

11EPALLES 2111202
3 0090 FEET DEPTH

DATE FROM TO	TIME OF DAY	DEPTH FEET	00665 PHOS-TOT MG/L P	32217 CHLRPHYL A UG/L	00031 INCDT LT REMNING PERCENT
74/03/05	14 20	0000	0.011	0.7	
	14 20	0005	0.011		
	14 20	0015	0.010		
	14 20	0030	0.009		
	14 20	0060	0.008		
74/05/14	14 20	0086	0.009	1.5	
	14 40	0000	0.020		
	14 40	0005	0.020		
	14 40	0017	0.021		
	14 40	0050	0.021		
74/08/07	14 40	0076	0.044	2.4	
	12 55	0000	0.027		
	12 55	0020	0.020		
	12 55	0035	0.022		
	12 55	0050	0.038		
74/10/28	12 55	0070	0.042	3.2	
	12 55	0075	0.060		
	08 30	0000	0.025		
	08 30	0001	0.026		50.0
	08 30	0005	0.026		1.0
	08 30	0013	0.025		
	08 30	0020	0.020		
	08 30	0040	0.020		
	08 30	0060	0.020		
	08 30	0083	0.024		

STORET RETRIEVAL DATE 76/02/11

482302
35 40 39.0 101 36 +5.0
LAKE MERENTH
48233 TEXAS

DATE FROM TO		TIME OF DAY		DEPTH FEET		WATER TEMP CENT		DO MG/L		TRANSP SECCHI INCHES		CONDUCTIVITY FIELD MICROHM		PH SU		T ALK CAC03 MG/L		NH3-N TOTAL MG/L		TOT KjEL N MG/L		NO2&NO3 N-TOTAL MG/L		PHOS-UIS URTHO MG/L P	
74/03/05		15	50	0000		5.9				108		1130		8.60		198		0.030		0.500		0.040		0.009	
		15	50	0005		5.8		10.4				1130		8.60		199		0.040		0.400		0.050		0.009	
		15	50	0015		5.8		10.2				1135		8.60		199		0.030		0.500		0.030		0.009	
		15	50	0045		5.7		10.4				1140		8.60		198		0.030		0.400		0.030		0.009	
		15	50	0072		5.6		10.0				1130		8.60		198		0.040		0.300		0.040		0.010	
74/05/14		15	05	0000		18.2				80		1555		8.30		189		0.040		0.500		0.030		0.009	
		15	05	0005		18.0		8.0				1535		8.40		187		0.070		0.200		0.070		0.007	
		15	05	0015		17.5		7.8				1506		8.32		188		0.070		0.300		0.080		0.007	
		15	05	0050		17.4		7.8				1505		8.30		188		0.040		0.300		0.030		0.006	
		15	05	0072		16.5		7.4				1472		8.10		189		0.080		0.200		0.080		0.008	
74/08/07		13	40	0000		24.4		6.0		84		1878		8.10		186		0.020		0.500		0.020		0.007	
		13	40	0020		24.2		6.4				1872		7.90		183		0.030		0.400		0.030		0.002K	
		13	40	0045		24.0		5.6				1858		7.70		184		0.030		0.300		0.030		0.003	
		13	40	0060		23.8		4.2				1850		7.70		184		0.050		0.300		0.070		0.010	
		13	40	0066		23.3		1.8				1824		7.30		196		0.100		0.600		0.120		0.035	
		13	40	0069		22.0		0.6				1763		7.30		195		0.100		0.500		0.140		0.033	
74/10/28		09	05	0000		16.8		8.2		42		1556		8.59		176		0.040		0.500		0.020K		0.012	
		09	05	0005		16.8		7.8				1556		8.49		174		0.020		0.600		0.020K		0.007	
		09	05	0020		16.8		8.0				1559		8.49		173		0.020		0.500		0.020K		0.010	
		09	05	0035		16.8		8.0				1559		8.48		173		0.020		0.500		0.020K		0.011	
		09	05	0055		16.8		8.0				1559		8.48		173		0.020K		0.500		0.020K		0.009	
		09	05	0072		16.8		8.2				1558		8.47		171		0.030		0.400		0.020K		0.014	

K VALUE KNOWN TO BE
LESS THAN INDICATED

STORET RETRIEVAL DATE 76/02/11

482302
35 40 39.0 101 36 45.0
LAKE MEREJITH
48233 TEXAS

11EPALES 2111202
3 0076 FEET DEPTH

DATE FROM TO	TIME OF DAY	DEPTH FEET	00665 PHOS-TUT MG/L P	32217 CHLRPHYL A UG/L	00031 INCOJ LT REMNING PERCENT
74/03/05	15 50	0000	0.012	1.0	
	15 50	0005	0.011		
	15 50	0015	0.012		
	15 50	0045	0.016		
	15 50	0072	0.015		
74/05/14	15 05	0000	0.021	1.2	
	15 05	0005	0.021		
	15 05	0015	0.022		
	15 05	0050	0.021		
	15 05	0072	0.041		
74/08/07	13 40	0000	0.022	0.2	
	13 40	0020	0.019		
	13 40	0045	0.029		
	13 40	0060	0.028		
	13 40	0066	0.064		
	13 40	0069	0.062		
74/10/28	09 05	0000	0.021	3.8	
	09 05	0005	0.021		
	09 05	0008			1.0
	09 05	0020	0.020		
	09 05	0035	0.021		
	09 05	0055	0.014		
	09 05	0072	0.026		

STORET RETRIEVAL DATE 76/02/11

482303
35 38 10.0 101 40 42.0
LAKE MEREDITH
48341 TEXAS

11EPALES 2111202
3 0049 FEET DEPTH

DATE FROM TO	TIME OF DAY	DEPTH FEET	00010 WATER TEMP CENT	00300 DO MG/L	00077 TRANSP SECCHI INCHES	00094 CONDUCTVY FIELD MICROMHO	00400 PH SU	00410 T ALK CAC03 MG/L	00610 NH3-N TOTAL MG/L	00625 TOT KJEL N MG/L	00630 N02&N03 N-TOTAL MG/L	00671 PHOS-DIS ORTHO MG/L P
74/03/05	16 20	0000	6.2		60	1150	8.60	198	0.030	0.400	0.030	0.009
	16 20	0005	6.2	10.4		1130	8.60	199	0.030	0.400	0.040	0.012
	16 20	0015	6.1	10.2		1150	8.60	198	0.030	0.400	0.030	0.009
	16 20	0030	5.8	10.4		1150	8.60	196	0.040	0.400	0.030	0.010
74/05/14	16 20	0044	5.8	10.2		1150	8.60	197	0.040	0.500	0.050	0.010
	15 30	0000	18.7		22	1586	8.30	190	0.060	0.400	0.070	0.006
	15 30	0005	17.5	8.0		1538	8.30	192	0.060	0.300	0.080	0.009
	15 30	0015	17.4	7.8		1536	8.30	191	0.060	0.200	0.080	0.008
74/08/07	15 30	0021	17.3	7.8	51	1533	8.40	191	0.060	0.300	0.070	0.009
	14 45	0000	24.7	6.6		1894	7.80	185	0.040	0.600	0.020	0.002K
	14 45	0015	24.5	6.8		1888	7.70	186	0.030	0.400	0.020	0.002K
	14 45	0030	24.1	5.4		1869	7.70	186	0.050	0.300	0.040	0.003
74/10/28	14 45	0040	23.8	5.0		1857	7.60	180	0.100	0.400	0.060	0.007
	09 35	0000	16.4	8.0	28	1537	8.49	177	0.030	0.700	0.020K	0.013
	09 35	0005	16.4	8.2		1536	8.49	177	0.020K	0.400	0.020K	0.013
	09 35	0015	16.4	8.0		1536	8.48	176	0.020	0.500	0.020K	0.012
	09 35	0030	16.3	8.0		1532	8.49	177	0.020	0.400	0.020K	0.012
	09 35	0046	16.3	8.4		1531	8.48	175	0.020	0.600	0.020K	0.012

DATE FROM TO	TIME OF DAY	DEPTH FEET	00665 PHOS-TOT MG/L P	32217 CHLRPHYL A UG/L	00031 INCDT LT REMNING PERCENT
74/03/05	16 20	0000	0.012	1.4	
	16 20	0005	0.020		
	16 20	0015	0.016		
	16 20	0030	0.016		
74/05/14	16 20	0044	0.013		
	15 30	0000	0.029	2.7	
	15 30	0005	0.036		
	15 30	0015	0.034		
74/08/07	15 30	0021	0.033		
	14 45	0000	0.022	4.3	
	14 45	0015	0.020		
	14 45	0030	0.023		
74/10/28	14 45	0040	0.056		
	09 35	0000	0.025	4.6	
	09 35	0005	0.020		
	09 35	0007			1.0
	09 35	0015	0.021		
	09 35	0030	0.022		
	09 35	0046	0.029		

K VALUE KNOWN TO BE
LESS THAN INDICATED

STOKET RETRIEVAL DATE 76/02/11

482304
35 33 30.0 101 45 12.0
LAKE MEREDITH
48375 TEXAS

11EPALES 2111202
3 0034 FEET DEPTH

DATE FROM TO	TIME OF DAY	DEPTH FEET	00010 WATER TEMP CENT	00300 DO MG/L	00077 TRANSP SECCHI INCHES	00094 CONDUCTIVITY FIELD MICROMHO	00400 PH SU	00410 T ALK CACO3 MG/L	00610 NH3-N TOTAL MG/L	00625 TOT KJEL N MG/L	00630 NO2&NO3 N-TOTAL MG/L	00671 PHOS-DIS ORTHO MG/L P
74/03/05	17 00	0000	7.8		60	1200	8.60	200	0.040	0.700	0.030	0.015
	17 00	0005	7.5	10.0		1185	8.60	199	0.020	0.500	0.020	0.011
	17 00	0015	7.1	6.0		1180	8.60	199	0.030	0.500	0.050	0.014
	17 00	0030	7.0	10.0		1200	8.60	199	0.030	0.600	0.030	0.010
74/05/14	15 55	0000	18.3		17	1586	8.35	188	0.090	0.400	0.140	0.011
	15 55	0005	18.0	7.6		1571	8.30	189	0.040	0.300	0.040	0.012
	15 55	0008	17.9	8.0		1561	8.40	189	0.060	0.500	0.070	0.013
74/08/07	15 20	0000	24.6	7.0	53	1894	7.60	185	0.050	0.400	0.030	0.002
	15 20	0015	24.5	7.2		1888	7.90	187	0.040	0.400	0.020	0.002K
	15 20	0027	23.7	6.4		1862	7.80	185	0.060	0.400	0.020	0.003
74/10/28	10 10	0000	14.8	8.6	14	1388	8.53	167	0.030	0.500	0.130	0.029
	10 10	0005	14.8	8.4		1389	8.53	168	0.030	0.400	0.120	0.028
	10 10	0012	14.8	8.2		1391	8.53	165	0.030	0.500	0.130	0.029

DATE FROM TO	TIME OF DAY	DEPTH FEET	00665 PHOS-TOT MG/L P	32217 CHLRPHYL A UG/L	00031 INCDT LT REMNING PERCENT
74/03/05	17 00	0000	0.020	1.9	
	17 00	0005	0.023		
	17 00	0015	0.037		
	17 00	0030	0.021		
74/05/14	15 55	0000	0.040	6.0	
	15 55	0005	0.055		
	15 55	0008	0.144		
74/08/07	15 20	0000	0.021	4.0	
	15 20	0015	0.022		
	15 20	0027	0.042		
74/10/28	10 10	0000	0.086	9.7	
	10 10	0003			1.0
	10 10	0005	0.063		
	10 10	0012	0.071		

K VALUE KNOWN TO BE
LESS THAN INDICATED

APPENDIX E

TRIBUTARY DATA

STORET RETRIEVAL DATE 75/03/10

422341
35 43 10.0 101 33 15.0 4
CANADIAN RIVER
48317 7.2 54.600
O/LAKE MEREUIT-
BANK SAMPLE AT N OUTLET SPILLWAY
11E-ALES 2111204
0000 FEET DEPTH CLASS 00

DATE FROM TO	TIME OF DAY	DEPTH FEET	00630 NUTRNO3 N-TOTAL MG/L	00625 TOT KJEL N MG/L	00610 NH3-N TOTAL MG/L	00671 PHOS-015 ORTHO MG/L P	00665 PHOS-TOT MG/L P
74/09/07	11 15		0.024	0.600	0.055	0.005K	0.005
74/10/04	10 30		0.016	0.400	0.015	0.015	0.015
74/11/13	15 30		0.056	0.600	0.050	0.005	0.020
74/12/16	15 25		0.088	1.650	0.074	0.008K	0.012
75/01/10	15 05		0.120	0.200	0.056	0.005K	0.010K
75/02/10	14 45		0.136	0.300	0.045	0.010	0.010
75/03/07	14 45		0.136	0.400	0.020	0.005K	0.010K
75/04/04			0.140	0.300	0.035	0.005K	0.010K
75/05/05	15 15		0.095	0.200	0.020	0.005	0.010K
75/05/27	09 00		0.065	0.150	0.010	0.005K	0.010K
75/06/17	10 55		0.020	0.450	0.020	0.005K	0.030
75/07/04	08 40		0.035	0.300	0.025	0.005K	0.010K
75/08/12	09 00		0.005	0.250	0.010	0.005K	0.020

K VALUE KNOWN TO BE
LESS THAN INDICATED

STONET RETRIEVAL DATE 75/03/10

4-2342
35 2- 12.0 101 52 45.0 4
CANADIAN IVER
4R 7.5 PUENTE
T/LAKE MEREUTH
HWY 87/287 BRDG 18 MI N JCT W HWY 60/66
ILIPALES 2111204
0000 FEET DEPTH CLASS 00

DATE	TIME	DEPTH	00630	00625	00610	00671	00665
FROM	OF		TOT N-TOTAL	TOT KJEL	NH3-N	PHOS-DIS	PHOS-TOT
TO	DAY	FEET	MG/L	N	MG/L	MG/L P	MG/L P
74/09/07	15	48	1.800	2.100	0.575	0.030	0.050K
74/10/07	15	30	1.200	2.800	0.145	0.008	0.050K
74/11/07	09	35	0.840	1.800	0.450	0.600	0.760
74/12/13	14	05	0.880	5.800	4.000L	2.560	2.720
75/01/07	14	10	0.504	3.000	1.420	0.850	0.950
75/02/07	11	15	0.770	6.500	4.100	2.300	2.300
75/03/10	14	30	0.580	6.800	3.100L	2.200	2.400
75/04/04	14	00	1.200	12.500	6.300	3.400	2.440
75/05/07	10	30	2.300	17.280	12.000	0.460	5.460
75/05/23	11	00	1.500	16.500	1.000	3.300	4.300
75/06/17	14	45	3.670	7.400	2.850	0.820	3.940
75/07/07	10	20	1.800	0.650	0.430	0.045	0.430
75/08/12	14	45	0.360	0.860	0.040		

L ACTUAL VALUE IS KNOWN TO BE
GREATER THAN VALUE GIVEN

K VALUE KNOWN TO BE
LESS THAN INDICATED

STORET RETRIEVAL DATE 76/03/10

482351
35 42 40.0 101 32 45.0 4
ADJUNCT
48 7.5 SANFORD
O/LAKE MEREDITH
BANK SAMP SM POND NEAR PUMPING STA
112P-LES 2111204
9000 FEET DEPTH CLASS 00

DATE FROM TO	TIME OF DAY	DEPTH FEET	00630 NO2&NO3 N-TOTAL MG/L	00625 TOT KJEL N MG/L	00610 NH3-N TOTAL MG/L	00671 PHOS-DIS ORTHO MG/L P	00665 PHOS-TOT MG/L P
74/09/07	11 30		0.072	0.500	0.020	0.005	0.010K
74/10/04	10 40		0.040	0.900	0.020	0.050	0.05H
74/11/13	15 40		0.024	0.800	0.025	0.005K	0.010
74/12/16	15 15		0.040	1.400	0.032	0.005K	0.010
75/01/10	15 15		0.056	0.350	0.040	0.020	0.030
75/02/10	15 00		0.064	0.400	0.020	0.005	0.010K
75/03/15	14 55		0.063	0.500	0.030	0.005	0.010
75/04/04			0.055	1.050	0.060	0.005K	0.010K
75/05/05	15 25		0.015	0.400	0.030	0.010	0.010
75/06/17	11 00		0.010	0.250	0.025	0.005	0.020
75/07/04	08 50		0.030	0.250	0.010	0.005K	0.010K
75/08/12	10 05		0.005	0.400	0.005	0.005K	0.010

K VALUE KNOWN TO BE
LESS THAN INDICATED

STONET RETRIEVAL DATE 7/20/03/10

422301
35 27 10.0 101 47 00.0 4
BONITA C. EX
48 7.5 CHUCKY
T/LAKE MEREJITH
2NDPY RD YING 0.6 MI S OF LX RANCH
11EPALES 2111214
0000 FEET DEPTH CLASS 00

DATE FROM TO	TIME OF DAY	DEPTH FEET	00630 NORAN03 N-TOTAL MG/L	00625 TOT KJEL N MG/L	00610 NH3-N TOTAL MG/L	00671 PHOS-DIS ORTH0 MG/L P	00665 PHOS-TOT MG/L P
74/09/07	16 24		0.028	0.900	0.095	0.005K	0.010K
74/10/07	14 30		0.016	0.300	0.015	0.005K	0.010K
74/11/13	09 10		0.024	0.600	0.010	0.005K	0.010K
74/12/09	09 20		0.080	0.800	0.064	0.020	0.027
75/01/07	13 45		0.072	0.200	0.020	0.016	0.020
75/02/07	09 45		0.575	0.400	0.010	0.010	0.060
75/03/18	13 54		0.040	0.550	0.010	0.005	0.010K
75/04/04			0.010	0.400	0.025	0.005K	0.010K
75/05/07	11 00		0.025	0.350	0.010	0.005K	0.010K
75/05/23	10 30		0.010	1.000	0.025	0.005K	0.020
75/06/17	14 00		0.015	0.450	0.055	0.010	0.010
75/07/07	09 51		0.010	0.150	0.015	0.005K	0.010
75/08/12	14 15		0.035	0.700	0.010	0.005K	0.040

K VALUE KNOWN TO BE
LESS THAN INDICATED

STORET RETRIEVAL DATE 7/6/03/10

4823F1
35 44 35.0 101 42 40.0 4
BIG BLUE CREEK
48 7.5 EVANS CANYON
T/LAKE MEREDITH
UNIMP RD XING- 5 MI NW JCT 2NDURY RD 1913
11EPALES 2111204
0000 FEET DEPTH CLASS 00

DATE FROM TO	TIME OF DAY	DEPTH FEET	00630 NO2SN03 N-TOTAL MG/L	00625 TOT KJEL N MG/L	00610 NH3-N TOTAL MG/L	00671 PHOS-DIS ORTHO MG/L P	00665 PHOS-TOT MG/L P
74/09/07	09 50		0.056	1.400	0.025	0.005K	0.015
74/10/04	09 40		0.032	0.700	0.010	0.005	0.010K
74/11/13	14 40		0.032	0.200	0.010	0.005K	0.025
74/12/16	14 30		0.200	0.600	0.040	0.005	0.030
75/01/10	14 10		0.272	0.100K	0.024	0.005K	0.020
75/02/10	13 45		0.256	1.200	0.024	0.016	
75/03/18	14 00		0.090	0.150	0.010	0.005K	0.010K
75/04/04			0.080	0.550	0.020	0.005K	0.010K
75/05/05	14 20		0.015	0.350	0.005	0.005K	0.010K
75/05/27	07 00		0.370	0.150	0.015	0.005K	0.010K
75/06/19			0.010	0.250	0.010	0.005	0.030
75/07/04	07 15		0.030	0.100	0.005K	0.005K	0.010
75/08/12			0.135	0.100	0.010	0.005K	0.010

K VALUE KNOWN TO BE
LESS THAN INDICATED

STORE RETRIEVAL DATE 76/03/10

4523G1
35 44 40.0 101 36 05.0 4
BUGREE CRFFK
48 7.5 SANFORD
T/LAKE MEREDITH
UNIMP RD KING 2 MI NW JCT 2NDRY RD 1913
JIEPALES 2111204
0000 FEET DEPTH CLASS 00

DATE FROM TO	TIME OF DAY	DEPTH FEET	00630 NO2&NO3 N-TOTAL MG/L	00625 TOT KJEL N MG/L	00610 NH3-N TOTAL MG/L	00671 PHOS-DIS ORTHU MG/L P	00665 PHOS-TOT MG/L P
74/09/07	10 30		0.016	0.500	0.005K	0.005K	0.015
74/10/04	10 10		0.016	0.400	0.010	0.005	0.010K
74/11/13	15 15		0.160	0.900	0.015	0.005K	0.010
74/12/16	15 00		0.336	2.200	0.032	0.005K	0.010K
75/01/10	14 45		0.256	1.100	0.032	0.005K	0.010
75/02/10	14 30		0.368	0.300	0.024	0.008K	0.010K
75/03/18	14 30		0.170	0.625	0.030	0.005K	0.010K
75/04/04			0.155	0.300	0.025	0.005K	0.010K
75/05/05	14 55		0.006	0.300	0.007	0.005	0.010K
75/05/27	07 35		0.005	0.500	0.025	0.005	0.060
75/06/19	10 30		0.005	0.300	0.015	0.005	0.010
75/07/04	08 00		0.025	0.350	0.010	0.005K	0.020
75/08/12	09 50		0.005	0.200	0.010	0.005K	0.020

K VALUE KNOWN TO BE
LESS THAN INDICATED