CONTROL OF LAND CONTIGUOUS TO FEDERAL RESERVOIRS

by

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Introduction

Federal reservoir construction without prior land use planning has cost this country many dollars in lost and wasted land use values. Federal land acquisition policies in the 1930's and early 1940's permitted the realization of some of the tertiary benefits in reservoir resource development. These policies have changed; this will make it more difficult for federal dam and reservoir projects to make full contribution to resource development unless state and local governments lend a hand in the planning of reservoir shore lands for industry, recreation, commerce, wildlife, residences, and open land. This situation also faces many governmental units in Kansas. By 1975, it appears that twenty-three federal reservoirs will be located within the boundaries of the state.

In order to explore the topic of this thesis, it would be well at the outset to review the evolvement of land use controls in the United States to the present time. During the colonial period, England attempted to make its land law serve as the basis of early colonial land law. In all of the colonies except New England, the land was generally granted in vast private holdings. Some land went to royal favorites who sought to set up a relationship between themselves and the colonists which resembled the relationship between the feudal lord of the manor and his tenants. Other large land areas were conveyed to speculators who hoped to sell at a profit, or to encourage colonization and gain the advan-

tages of monopolistic restrictions on trade.[1]

In 1763, King George attempted to halt the westward advance of settlers by forbidding settlements beyond the sources of rivers flowing into the Atlantic Ocean.[2] When the settlers saw such great expanses of idle land adjacent to them, they were not satisfied to work as employees or tenants. "The frontier philosophy was the land belonged to him who would use it."[3] These land policies of the English Government contributed to the causes of the American Revolution.

The Revolution banished the remnants of feudalism and the tenure system; a radical experiment of a free land system in a market economy was innovated.[4] The colonies were taken over by the states and redistributed mostly in small holdings. Antique property laws were discarded and primogeniture was abolished.[5] Thus, land ownership became the accepted right of the citizen.

The dominance of the private land owner was not automatic, due to the fact that nearly all of the land was publicly owned at one time or another during the half century that followed the Revolutionary War. The thirteen states ceded a large portion of their western territory to the Federal Government and the Louisiana Purchase added over 500 million acres in 1803 to the public domain.[6]

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[1]Frank E. Horack, Jr. and Val Nolan, Jr., Land Use Controls, p. 18.

[2]John Delafons, Land Use Controls in the United States, p. 16.

[3]Horack, op. cit., p. 18.

[4]Charles M. Harr, Land Use Planning, p. 16.

[5]Delafons, op. cit., p. 16.

[6]Ibid., p. 16.

This public domain covered nearly 1,425 million acres at one time, and debate was raged over the proper management of these lands for over sixty years. John Quincy Adams and others wanted to secure compact settlement of the land and make it a source of public benefit as well as private profit. On the other hand, Jefferson and Jackson urged the policy of rapid and extensive development to build a nation of individual freeholders. The public demand for free access to land was tremendous, and Adams obligingly confessed that his policy had failed.

The Homestead Act of 1862 granted land for a number of years with the government exercising little or no control over the development of land. Nearly two million acres were staked for claim by pioneers in one day when the Oklahoma Territory was opened for settlement on April 22, 1889.[7] Thus, with these influences and others, the right to own and develop land free from government influence became a key principle in American economic theory. The basic assumption can therefore be proposed, that the American economic way of life is founded on the principle of the free market and the private enterprise system. There is strong prejudice against government control over any aspect of the economy. In matters of land economics, it is generally assumed that land uses are most efficiently organized if the decisions are made by the market, and the objective of control is simply to correct maladjustments in land utilization. This maladjustment in land utilization is evidenced when the private land

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[7] Ibid., p. 17.

owner or private enterprise utilizes a piece of land which impinges on the public health, safety, morals, or the general welfare of the people.

Compulsory Powers of the State

The exercise of police power, a compulsory power of the state, enables the public to regulate uses of spatial units in the interest of public health, safety, morals, and welfare. This exercise of power must be reasonable and within constitutional limits. It does not require that owners of rights shall be granted compensation if losses are sustained. Three important and well-known extensions of the police power are zoning, subdivision regulation, and building and housing codes.

The second compulsory power of the state is the power of eminent domain. This is a "soverign power of government which enables the public to appropriate private rights by due process of law without the owners consent for public use upon proper payment."[8] Today, condemnation proceedings, the process of exercising the power of eminent domain, may be employed to promote the public welfare. In many states, this power may be invoked to take private property for such uses as slum clearance, public housing, and urban redevelopment. Land acquired for highway construction is an example of one of the most widely used powers of eminent domain. This power is exercised by the Corps of Engineers, the Bureau of Reclamation, and the Tennessee Valley Authority for acquisition of land for public reservoirs.

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[8] Ernest M. Fisher and Robert M. Fisher, Urban Real Estate, p. 451.

Taxation is the third sovereign power of government to raise revenues for public purposes by means of enforced monetary contributions levied equally and uniformly without reference to special benefits conferred.[9] Revenues may be raised by various forms of taxation. The general property tax is the source most widely used for local support of public service and is levied upon the value of tangible and intangible real and personal property. In property taxation of land, land value and improvements are assessed and the tax rate and the assessed valuation are utilized to calculate the amount of taxes that are to be paid.

The fourth principal compulsory power of the state is the penal power. This is the right to punish those who violate the law by fines or imprisonment; it prohibits individuals from ignoring or disobeying a law with impunity.[10]

The spending power of government can also have major effects on land use. The construction of roads, schools, power projects including reservoirs and airports effect land use. Subsidies, defense and other government purchases can guide the nature of private land use. These powers are some of the basic tools by which the people express their public interest in private land in the United States. They may be delegated to lesser governmental units in varying ways and amounts.

The Federal Constitution has very few restrictions on land use planning. The Tenth Amendment states that "The powers not delegated to the United States

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[9] Ibid., p. 454.

[10] Mary Clarke Santopolo and Carl P. Chelf, Planning and Zoning in Kentucky, Kentucky Legislative Research Commission Report 11, p. 5.

by the Constitution, nor prohibited by it to the states, are reserved to the states respectively, or to the people."[11]

These reserved powers discussed previously have become known as police powers. The police power is the power of government to promote the public safety, health, morals and the general welfare. Since planning and land use controls are sustained for these purposes, the Tenth Amendment is the Constitutional basis for such action.[12]

Important United States Supreme Court Cases Which have Set the Precedent for Land Use Controls

There are a number of United States court cases relating to land use controls. Three cases stand out as particularly important ones. The Hadacheck case in Los Angeles, 1913, set a precedent for the control of land use by the exercise of the police power. Mr. Hadacheck had constructed a brickyard and kiln in a residential district which was discharging dust, fumes and smoke into the area. The court's decision forced him to cease his brick manufacturing operation, although (1) his land contained valuable deposits of clay suitable for brick-making, (2) his land was more valuable for brick-making than for any other purpose, (3) the land had been acquired by him before it was annexed to the municipality, and (4) he had utilized this land for considerable length of time as a brickyard.[13] In this instance, full zoning rights under the exercise of the

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[11] U. S. Constitution, Amendment X.

[12] Santopolo, op. cit., p. 5.

[13] Ibid., p. 7.

police power were upheld as long as the ordinance was reasonable and for the good of the community even if there was a limitation placed upon the individual.

In 1926, the village of Euclid, Ohio, passed a comprehensive zoning ordinance which halted industrial expansion of the Ambler Realty Company. This company declared that the ordinance invaded constitutional rights and asked for an injunction restraining an enforcement of the ordinance. The United States Supreme Court upheld the comprehensive zoning law. This decision set the precedent for comprehensive zoning and in addition, viewed the nature of the police power as a tool that could cope with the changing circumstances of modern life.

> Such regulations are sustained under the complex conditions of our day, for reasons analogous to those which justify traffic regulations, which before the advent of automobiles and rapid transit street railways, would have been condemned as fatally arbitrary and unreasonable... In a changing world it is impossible that it should be otherwise.[14]

The Euclid Village decision appears not to have been weakened due to the fact that the court has reviewed relatively few cases of this type since 1926.

In 1954, the Supreme Court went further in upholding land use controls. In Berman vs. Parker, the Court stated:

> The concept of the public welfare is broad and inclusive. The values it represents are spiritual as well as physical, aesthetic as well as monetary. It is within the power of the legislature to determine that the community should be beautiful as well as clean, well-balanced as well as carefully patrolled... If those who govern the District of Columbia decide that the Nation's Capitol should be beautiful as well as sanitary, there is nothing in the Fifth Amendment that stands in the way.[15]

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[14] Euclid v. Ambler Realty Co., 272 U. S. 387 (1926).

[15] Berman v. Parker, 384 U. S. 26 (1954).

Although this case relates primarily to urban renewal, it indicates a tolerant attitude on the part of the Court toward community planning in general. The Court recognized that a community should be developed in a balanced integrated manner. There is also encouragement for aesthetic zoning in the Court's remarks.

More recently, the Supreme Court of the United States has stated that:

> The police power of a state embraces regulations designed to promote the public convenience or the general prosperity as well as regulations designed to promote the public health, the public morals, or the public safety.[16]

The public convenience as well as the public safety is promoted when parking is prohibited on certain streets to assure access to important areas. The general prosperity of the public is protected when dangerous or obnoxious uses are prohibited in residential areas; property values are protected from depreciation.[17]

In general, the Supreme Court has taken a favorable attitude toward control of land uses as related to planning and zoning powers when they have been reasonable and shown some relationship to the health, safety, morals and general welfare, convenience, and prosperity of the public.

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[16] Chicago B. & O. Ry. Co. v. Drainage Commissioners, 200 U. S. 561, 592.

[17] Arthur B. Gallion and Simon Eisner, The Urban Pattern, Second Edition, D. Von Nostrand & Co., Inc., p. 173.

Summary of Land Development Procedures and Actions of the Supreme Court

It can be noted that in Colonial times, land was controlled by private landholders who owned vast amounts of land. During and after the Revolution, the citizens of the United States became a nation of small land developers and owners with little or no government controls. Land use decisions were made by private businessmen, realtors, land developers and bankers. Nineteenth century Americans did not believe that a greater community interest stood above that of the individual interests of these men. As urban blight and depreciation of land values occurred in cities, attitudes toward uninhibited private activities began to change. Through constitutional authority, enabling statutes, and court decisions, land uses can be controlled when the public good is involved. Control of land uses can be exercised by local units of government and regions through enabling statutes enacted by state legislatures. Depreciation of land values, among other things, are occurring from misuse of land contiguous to federal impoundments; provisions for control of land in reservoir areas is becoming an immediate concern for local and state legislators.

Charles M. Haar, Professor of Law at Harvard University, has reviewed the evolvement of land use and property laws in eighteenth century England to contemporary times in the United States. He noted that the elder Pitt had stated: "the poorest man in his cottage could defy the King - storms may enter; the rain may enter - but the King of England cannot enter."[18] Professor Haar,

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[18] Horack, op. cit., Preface.

viewing contemporary land use policies, stated:

> The United States Supreme Court by upholding in sweeping terms urban redevelopment legislation has ruled in effect that the King not only may enter, but may remain, in the name of the general good, indeed for the very purpose of keeping the rain out.[19]

Role of the State Courts

States grant power to municipalities and other forms of local government through their constitution or through statutes enacted by their legislatures. In most states, planning and zoning is granted to local governmental units through enabling statutes. Most statutory provisions are permissive rather than mandatory; thus, state courts have played an important role in determining the planning and zoning powers enacted by state legislatures.[20] The state courts have been quite liberal in their interpretations of the extent of the police powers.

Property Rights in Land Resources

The United States Corps of Engineers, Bureau of Reclamation, and the Tennessee Valley Authority acquire certain property rights to land that is utilized for reservoirs. These rights usually range from fee simple ownership to various types of easement policies which will be discussed later when land acquisition policies of the Federal Government are discussed.

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[19] Ibid., Preface.

[20] Santopolo, op. cit., p. 8.

The concept of property rights ranges from complete ownership to the limited rights held under a lease or an inheritance arrangement. Raliegh Barlowe, a leading agricultural economist, has defined the types of rights in the control of property. Some which possibly would be applicable to reservoir land use planning and controls are listed and summarized below.[21]

1. Fee simple ownership is the highest combination of rights that can be held in landed property. The fee simple owner has the right to possess, utilize, and within reason to exploit, abuse, and even destroy his land resource. However, he does not have absolute rights. His rights are limited by the over-all interests of society administered by the state. The most important limitations are the powers of eminent domain, taxation and the police power.
2. Easements are rights held by others to use one's land for special purposes. They can involve a wide variety of privileges and stay with the land when property is transferred to new owners. Easements commonly utilized are airspace, utility and drainage.
3. Deed reservations limit the scope of ownership rights. Mineral rights, timber-cutting rights and rights-of-way are examples of this type of restriction.

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[21] Raliegh Barlowe, Land Resource Economics, p. 339-347.

4. Deed restrictions and covenants are used to impose private controls over future land use. Private land developers may require certain types of house construction, location of buildings, prohibition of certain uses, and other controls over future use of a site if they are not contrary to public policy.
5. Leases are contracts that authorize a lessee the right to possess and use property held or owned by a lessor. The lessor, unless reserved to him in the lease, has no right to interfere with the lessee's use of the land. It is ordinarily expected that the lessee will return the land, machinery, buildings, etc. to the lessor in approximately the same condition as he received them, less normal wear and damage by the elements.

Control of Surface Water Rights

Two patterns of water rights law have developed in the United States which are the riparian doctrine and the appropriation doctrine. The riparian doctrine is based on common law which gives holders of land bordering on water the right to have the water cross their property in its natural flow and in undiminished quantity or quality.[22] This doctrine has been modified in most states which gives a riparian owner the right to a "reasonable use" of water even though the flow is thereby diminished. "Reasonable use" has been

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[22] State Administration of Water Resources, Council of State Governments, p. 29.

defined by the courts generally to include domestic consumption and stock watering, but generally does not include water for irrigation, industrial or recreational uses.

The appropriation doctrine is based on a statutory system and usually is accompanied by fairly elaborate administrative mechanisms as well as the right to appeal to the courts.[23] Water may be taken regardless of its contiguity to the stream. The rule of "first in time, first in rights" principle became a recognized practice in the arid section of the United States where irrigation was essential to any permanent agriculture.[24] Table 1 indicates the differences between the riparian and appropriation doctrines.

Table 1. Comparative water rights.[25]

Riparian Doctrine	Appropriation Doctrine
1. Riparian rights are inherent in the land and are acquired by acquiring title to the land.	1. Appropriation rights are acquired by statutory procedures and usually placed under the supervision of the State Engineer.
2. Land must be contiguous to the stream.	2. Contiguity to a stream is not a criteria.
3. Can divert water for "natural uses" as long as it does not interfere with similar rights of other riparian owners.	3. First in time can withdraw as much water as is needed for "beneficial" uses regardless of the needs of others.
4. Is not limited to a specific quantity of water	4. Sets a definite quantity of water allocated: also may be limited to a certain time of the year or even to certain hours during each 24-hour period.
5. Does not lose rights with non-use.	5. Loses rights with non-use.

[23] Ibid., p. 29.

[24] Edward Hamming, "Water Legislation", Economic Geography, January, 1958, 34:44.

[25] Ibid., p. 42.

The appropriation doctrine is utilized by eight western states, which are Arizona, Colorado, Idaho, Montana, Nevada, New Mexico, Utah, and Wyoming. This is the core of the arid states where water is state or public property. In the nine states of Texas, Oklahoma, Kansas, Nebraska, South and North Dakota, California, Oregon and Washington, the riparian doctrine has been modified to the extent that diversion of water for irrigation is a recognized riparian use. These states have both humid and dry sections within their boundaries. It is recognized that the riparian owner has superior rights; however, if the riparian owner fails to utilize his water allotments for irrigation, his rights may be given to the non-riparian appropriator. The remaining states east of the 100th meridian, which are humid and have considerable surface water, operate under the riparian principle.[26]

The Kansas Water Appropriation Law of 1945 established the doctrine of prior appropriation and thus modified the previous common law doctrine.[27] This law does not apply to the taking of water for domestic purposes which includes uses for household purposes, watering of livestock, poultry, farm and domestic animals and watering of gardens and lawns. In addition, persons making beneficial use of water as of June 28, 1945, were not deprived of their common law rights to continue that use. Therefore, the appropriation procedure applies only to non-domestic uses after June 28, 1945. The basic principle of

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[26] Ibid., p. 46.

[27] Marcene Grimes, Government and Natural Resources in Kansas Water, University of Kansas Governmental Research Center, p. 41.

"first in time, first in right" is utilized in determining the priorities to appropriate water from a designated source when there are more applications than there is water available for distribution.

The trend is definitely toward the appropriation doctrine in water legislation which calls for effective public control. Flowing water is a public resource and if regulation of this resource is essential to the public welfare, it can be justified as an exercise of the police power of the state. Water released in time of drought in the interest of the public health and welfare from the conservation pools of Kansas reservoirs having low-flow storage allocations provided at federal expense cannot be taken from the stream for other uses.[28]

It is generally true that riparian owners of land contiguous to large inland navigable lakes can exclude the public from using the part of the shore between the high and low water marks whether the strip of land is owned by the public or by the riparian owner.[29] The land lying between conservation and high water pools of federal reservoirs in Kansas, if not held in fee simple ownership, is controlled by easement by the Federal Government. The land owner whose land is controlled by easement can exclude the public from access to the shoreline.

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[28] Report to the 1961 Kansas Legislature Concerning State Water Policy and Program Needs, Kansas Water Resources Board, p. 28.

[29] Water for Recreation - Values and Opportunities, Report No. 10, Outdoor Recreation Resources Review Commission, p. 20.

PURPOSES OF FEDERAL RESERVOIRS

History of Reservoir Development

Prior to 1900 in America, many single-purpose reservoirs were built by private persons and the public. The first substantial effort at dam construction was undertaken in New Hampshire. This dam which formed Massabesic Lake in 1738 provided power for a gristmill and sawmill. In the early 1800's, many dams were built to supply canal water. The first large irrigation reservoir was constructed at French Lake, California, and the first hydro-electric station began operation in 1882 at Appleton, Wisconsin. Dams constructed for flood control have been chiefly twentieth century phenomena with the Corps of Engineers developing interest in flood control after the creation in 1879 of the Mississippi River Commission.[30]

The Bureau of Reclamation Act brought the national government into western irrigation construction and the Flood Control Act of 1936 involved the Corps of Engineers in flood control measures. Prior to 1928, the Corps and Bureau efforts were concentrated on single-purpose structures which occasionally had other minor purposes.

The multi-purpose idea finally was adopted in 1928 in the Boulder Canyon Project Act. The Hoover Dam was dedicated for the purposes of flood control, improvement of navigation and regulation of flow of the Colorado River, storage and the generation of electrical power.[31]

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[30] Roscoe C. Martin, Gutherie S. Birkhead, Jesse Birkhead and Frank J. Munger, River Basin Administration and the Deleware, p. 232, 233.

[31] Ibid., p. 233.

During the depression years and after World War II, governmental spending greatly aided planning and building of water control structures, and by 1956 there were approximately 476 control structures with two or more purposes in the United States. Twenty-one of these dams had a usable reservoir capacity of 2 million acre feet or more and were multi-purpose in character. All of the 21 reservoirs were constructed by the Corps of Engineers, Bureau of Reclamation, or by the Tennessee Valley Authority.[32]

Purposes of Corps of Engineer Reservoirs

The earliest justification of water control activities and reservoir construction by the Corps was the improvement of navigation. The Corps' interests were later expanded to include flood control through the Flood Control Acts of 1936 and 1944, hydro-electric power generation, water supply, low flow regulation for water quality control, fish and wildlife conservation, recreation and other beneficial purposes.[33] Prior to 1959, the Corps treated recreation largely as a by-product of reservoir construction. Since that time, recreation has been given full consideration as a project purpose along with other purposes which can be noted for projects in the Delaware and Kansas River Basins.[34] Specifically, Corps reservoirs in the Kansas River Basin are constructed for

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[32] Ibid., p. 233, 234.

[33] Multiple Use of Land and Water Areas, Report 17, Outdoor Recreation Resources Review Commission, p. 25.

[34] Ibid., p. 25.

flood control, water supply storage, low flow supplementation, fish and wildlife conservation, recreation, streambank stabilization and related purposes.[35]

Purposes of Bureau of Reclamation Reservoirs

Initially in 1902, the Bureau of Reclamation was charged with the investigation, construction, operation and maintenance of irrigation works in seventeen semi-arid western states. Hydro-electric power generation and improvement in stream navigation developed as construction of irrigation works increased. Presently, the Bureau's interests also include the provision of water for municipal, domestic, and industrial use, conservation of fish and wildlife, abatement of sedimentation, salination and pollution of streams and other water courses, and provision of new or enhanced recreational facilities.[36]

The Bureau's authority is limited in the field of recreation due to the lack of recognition of recreation as a primary objective in project construction. Recreation has not been included as a primary objective due to the philosophy of the Reclamation Program which requires that federal costs for project development would be repaid by project benefits. Since benefits from recreation are more or less intangible, recreation cannot be considered as a project purpose. In recent years, some non-reimbursable funds have been provided for recreational facilities in Bureau projects, but funds have not been provided

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[35] Letter from the Secretary of the Army, Kansas River and Tributaries, Kansas, Nebraska, and Colorado, 87th Cong. 2nd. Sess. Doc. 20 122., p. 22.

[36] Outdoor Recreation Resources Review Commission, op. cit., p. 9.

for recreational facilities on existing projects constructed earlier.[37] As indicated previously, the Corps of Engineers consider recreation as a project purpose. Corps' objectives are aimed at optimum realization of net benefits which include both tangible and intangible benefits.[38] This would indicate that the greatest dollar return or output is not an absolute necessity in project development.

It is evident as more and more Corps and Bureau reservoirs are built, their project objectives are becoming more and more multi-purpose. In the Delaware River Basin Comprehensive Plan, the Corps has planned to construct three reservoirs whose main purposes are initially for recreation with expansion to other purposes at a later date.[39]

Corps of Engineers and Bureau of Reclamation Reservoirs in Kansas

Surface water distribution varies considerably in Kansas. Precipitation and surface run-off quantities tend to increase from west to east across the state, which results in much more surface water in Eastern Kansas, than in Western Kansas. The yearly precipitation ranges from 16 inches in the western part of the state to over 40 inches in the southeastern portion.[40] The precipitation pattern is also quite variable within areas. For example, the Oswego climatological station in Southeastern Kansas recorded a maximum annual

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[37] Ibid., p. 19.

[38] Ibid., p. 25.

[39] Vincent G. Terenzio, "Development and Effect of the Delaware River Basin Compact", American Water Works Association Journal, December 1962, 54:1455.

[40] Kansas Water Resources Board, op. cit., p. 9.

precipitation of 56.7 inches in 1951. In 1952, this station recorded an annual precipitation of 25.4 inches; the average annual precipitation at Oswego is 40.7 inches. Variations in precipitation such as this causes extreme variations in run off and streamflow over varying periods of time.

The 1951 storm in East-Central Kansas, was one of the greatest ever recorded in the United States by the Weather Bureau. Two months of excessive rainfall, culminated by four days of 10 inches or more of rainfall in July on more than 10 percent of the Kansas River Watershed, caused a flood that far exceeded any previous record on the Kansas River and its tributaries.[41]

Another factor which complicates streamflow is that approximately 75 to 85 percent of the total annual supply of water in streams occurs during approximately 15 percent of the time.[42] All of these factors: variances in rainfall by location, variances of rainfall within areas, and seasonal rainfall variances produce streamflow conditions which are rarely average flow conditions. On typical Kansas streams, average flows are equaled or exceeded approximately 15 percent of the time and many of the streams are dry for the same length of time.[43] Plate I indicates the magnitude of the average stream flows in Kansas, and ground water regions in generalized form.

Plate II indicates the existing and proposed locations of federal reservoirs in Kansas. The Corps reservoirs are nearly all located in the eastern

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[41] Abel Woolman, Louis R. Howson and N. T. Veatch, Report on Flood Protection in Kansas River Basin, p. 3.

[42] Kansas Water Resources Board, op. cit., p. 9.

[43] Ibid., p. 9.

half of the state where stream flow and flooding is the greatest. The Bureau reservoirs are located in central and western portions of the state where run off is the least.

All Kansas reservoirs have sizable flood control allocations; storage space is provided for the temporary impoundment of floodwaters.[44] All reservoirs have a storage allocation to permit future sedimentation. Usually, this sediment reserve is filled with water initially which permits establishment of a minimum water level for recreational uses of the reservoir. During emergencies, water may be released from the reserve pool to meet public health needs downstream.

Nearly all of the constructed or authorized Corps reservoirs have low-flow storage allocations provided by federal expense. These pools are quite small in comparison with the total capacities of the reservoirs. Releases from these pools in time of drought can be made in the interest of the public health and welfare.

One Bureau reservoir has specific federal storage allocation for fish and wildlife purposes. Other reservoirs also provide these benefits without specific water conservation allocation for this purpose.

All of the Bureau reservoirs are, or will be, utilized for irrigation water storage. This water cannot be used for other water supply purposes such as

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[44] Ibid., p. 27.

EXPLANATION OF PLATE I

Maps of Kansas, showing mean stream flow and ground water regions.

Fig. 1 - Mean Flow of Kansas Streams.

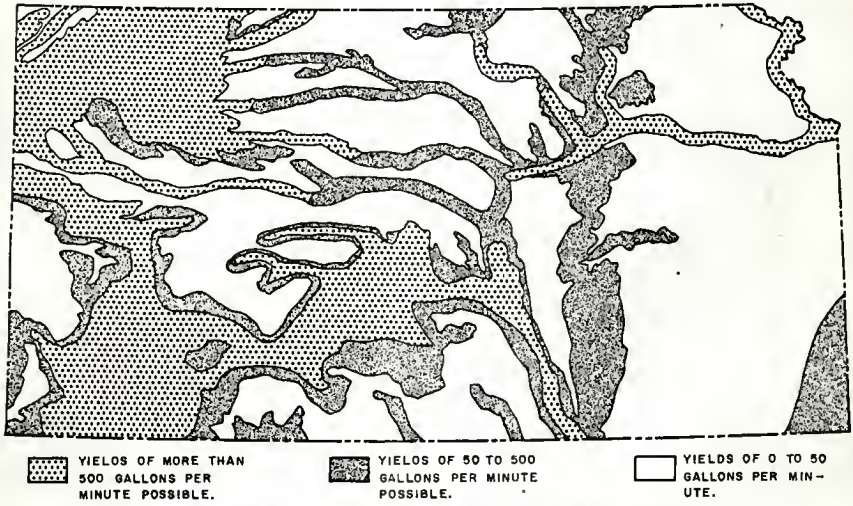
Fig. 2 - Generalized Ground Water Regions.

PLATE I

MEAN FLOW OF KANSAS STREAMS

Fig. 1

GENERALIZED GROUND-WATER REGIONS



Generalized surface water and ground-water regions in Kansas.

Fig. 2

EXPLANATION OF PLATE II

Maps of Kansas, showing status of federal reservoir projects.

Fig. 1 - Status of Corps of Engineers Reservoirs.

Fig. 2 - Status of Bureau of Reclamation Reservoirs.

STATUS OF CORPS OF ENGINEERS RESERVOIRS, OCTOBER, 1960

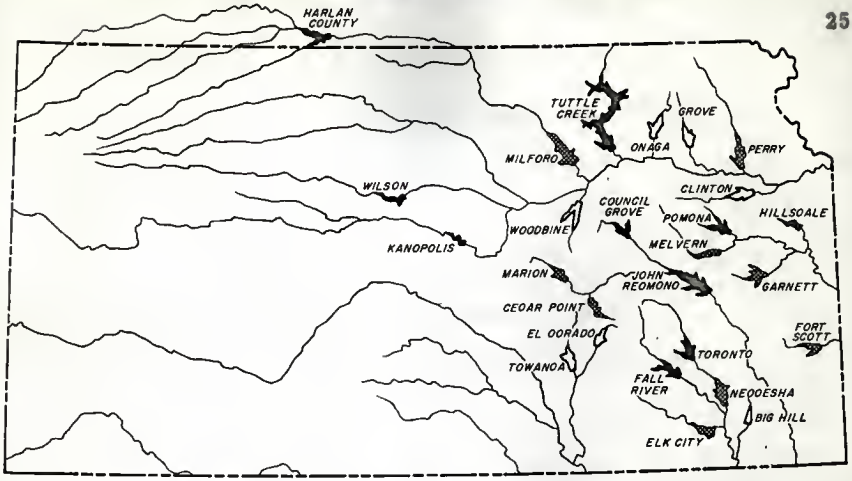
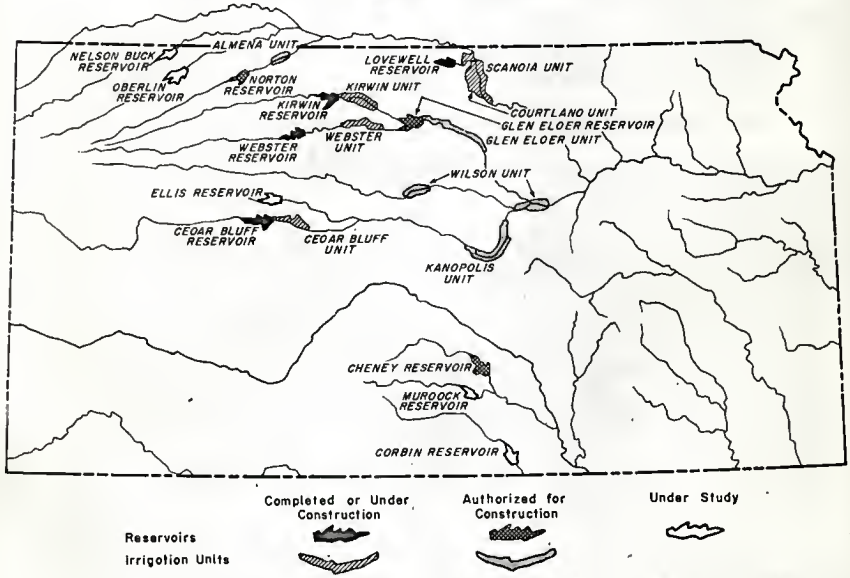


Fig. 1

STATUS OF BUREAU OF RECLAMATION PROJECTS, OCTOBER, 1960



Stotus of Corps of Engineers ond Bureou of Reclomotion projects in Konsos as of October, 1960.

Fig. 2

municipal or industrial uses except through the formulation of a repayment contract with the Federal Government.[45]

In 1958, a state constitutional amendment provided that local units of government could consider future development of water storage which they previously were prohibited from doing by the state constitution. Additional incentive for water storage was initiated at the federal level by the Federal Supply Act of 1958. This statute provides that up to 30 percent of the costs of a federal multi-purpose project undertaken by the Corps and Bureau can be allocated to future municipal and industrial water supply needs, provided some non-federal entity can reasonably assure that they will need water in the future and that they can repay the initial federal advancement of federal costs.[46] State or local governments have 50 years to complete repayment after storage for water use is first initiated.

An enabling Kansas state statute of 1957, G. S. 1959 Supp., 12-2716; 12-2717, permitted the City of Wichita to obligate itself for non-federal costs of obtaining water supply in the Cheney reservoir. State statute (G. S. 1959, Supp., 12-2718 to 2721) authorizes cities with less than 200,000 population to contract with the Federal Government for obtainment of municipal water supplies and recreational areas in federal reservoir areas.[47]

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[45] Ibid., p. 28.

[46] Ibid., p. 31.

[47] Ibid., p. 31.

In summary, the purposes for which federal financing is obtained for large reservoir construction in Kansas, are storage of water, irrigation, flood control, sedimentation and low-flow storage which permits water recreational uses due to an establishment of a minimum water level of the reserve pool, and fish and wildlife purposes. State statutes now permit local governments to obligate themselves for water storage and recreational uses in federal reservoir construction.

Purposes of Tennessee Valley Reservoirs

The greatest experiment in the regional development of water resources is the Tennessee Valley Authority. The TVA is a federal public corporation formed in 1933 with jurisdiction authorized to perform integrated multiple-purpose river development.[48] The TVA is authorized to provide flood control for the Tennessee Basin, to improve navigation on the river, and to provide hydroelectric power. The TVA is also authorized to encourage the conservation and development of natural resources with specific reference to reforestation, production and sale of low cost fertilizers, and the proper use of marginal lands.[49]

Although recreation development is the responsibility of local government, the TVA does assist and encourage recreation development by making land available to other agencies and then advising and assisting them in recreation development.[50] A cooperative effort of the TVA, local governments and the

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[48] Land and Water: Planning for Economic Growth, Western Resource Papers 1961, Colorado University Press, p. 41.

[49] Ibid., p. 41.

[50] Outdoor Recreation for a Growing Nation, Tennessee Valley Authority, P. 1.

Tennessee State Planning Commission has produced and partially implemented a land use plan for the Melton Hill Reservoir which will be discussed later in greater detail.

FEDERAL LAND ACQUISITION POLICIES

Power of Land Acquisition

The government has the authority to acquire private land for public use through the right of eminent domain. However, the Fourteenth Amendment provides that private property shall not be taken without just compensation. The determination of just compensation is a difficult task which may be ultimately determined by the courts. Through the years, the courts have established the meaning of just compensation as being the fair market value or the price on the date of taking which a willing buyer would pay a willing seller.[51] The courts have also stated that when property is acquired for public use, the owner should be placed in the same financial position he would have been in if the property had not been acquired; the price offered the owner should be high enough to enable him to buy comparable property.

In order to study the problems relating to controls of land contiguous to federal reservoirs, it is necessary to determine the amount of land which will be retained in private ownership and the amount which will be acquired for public ownership. If publicly owned, land is usually held in fee simple ownership and

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[51] Reducing Adverse Effects of Reservoirs, Great Plains Council Publication No. 6, Kansas State College Agricultural Experiment Station, p. 9.

taken off the tax rolls. This often results in a reduction of revenue to some units of government which is not offset by benefits received from the project or a reduction in governmental costs which might occur from a reduction in the size of the governmental unit. In recognition of these losses, Congress has passed laws to provide payments in lieu of taxes for certain of its programs.

Payments in lieu of taxes are made to reduce adverse affects of reservoir construction. In many of the reservoirs constructed by the Corps of Engineers, land located at higher elevations is flooded infrequently and can be utilized in nearly the same manner as before the dams were constructed; these lands can be leased to the public. If this arrangement occurs, the Federal Government returns 75 percent of the rent collected by the Corps to the counties for school and road purposes. However, none of the money can be used for general county purposes. The leasing program at a particular site and the distribution of rental returns results in the favorableness or unfavorableness of these payments to counties.[52]

No provision has been made for payments in lieu of taxes for lands acquired by the Bureau of Reclamation for reservoir purposes. These reservoirs are constructed for irrigation purposes mainly, and a full pool has to be maintained for a large part of the growing season. Therefore, only a low proportion of the land could be leased and the rental returns could be quite limited.

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[52] Ibid., p. 17, 18.

Acquisition Policies of the Corps of Engineers and The Bureau of Reclamation

The Corps and Bureau acquire land through condemnation or purchase. If the owner of a private plot of land asks a reasonable price for his land (a price that a willing buyer would pay a willing seller), it may be acquired by purchase. The land value is determined by a staff of land appraisers with their appraisals subject to review and modification by higher authorities.[53] If the land cannot be acquired by purchase, condemnation proceedings are initiated in order to finally acquire the land.

The joint policy adopted by Corps of Engineers and the Bureau of Reclamation of the Department of the Interior in 1953 permitted the acquisition in fee of all lands within 300 feet horizontally from the edge of the conservation pool. Where topography was precipitous or unusually flat, lands could be acquired which were included in the five-year flood frequency rather than lands lying 300 feet horizontally from the conservation pool. Flowage easements could be obtained over lands which may be subject to flooding at interals in excess of five years.[54] The Corps has generally taken the position that acquisition of additional lands other than that which is needed for establishment and operation of the reservoir is required in order to permit access to the shoreline

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[53] TVA Land Acquisition Experience Applied to Dams in the Missouri Basin, Great Plains Council Publication No. 9, South Dakota State College Experiment Station, p. 25.

[54] United States Department of the Interior, Office of the Secretary, Washington, January 13, 1954, Order No. 2744, p. 1

normally at intervals of five miles along each side. Recreational facilities could be located on lands required for primary reservoir purposes and access; however, additional lands could not be obtained for recreational purposes only.[55]

However, since 1953, courts have upheld the acquisition of additional land for recreational purposes along with reservoir development. In a case involving the Bull Shoals Dam and Reservoir in 1954, the condemnation of a strip of higher land which would become a long peninsula jutting into the reservoir was upheld on the grounds that public ownership of the peninsula might help to protect the reservoir; it was apparent that private resort development was going to occur which might be incompatible to the uses of the reservoir.[56]

In another case involving the Gavins Point Reservoir and Dam in Nebraska, in 1961, a circuit court of appeals stated that a certain 42.5-acre tract of land would be largely useful as a recreation area for persons visiting the reservoir, although the land was originally condemned for purposes of access.[57]

In F. R. Document 62-1906 of 1962, the Department of the Interior and Army stated their joint policies relative to reservoir project lands. In acquisition of lands for reservoir purpose the document stated:

> Insofar as permitted by law, it is the policy of the Departments of the Interior and Army to acquire, as a part of reservoir project construction, adequate interest in lands necessary for the realization of optimum values for all purposes including additional land areas to assure full realization of optimum present and future outdoor recreational and fish and wildlife potentials of each reservoir.

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[55] Land Acquisition for Outdoor Recreation - Analysis of Selected Legal Problems, Report 16, Outdoor Recreation Resources Review Commission, p. 21.

[56] Ibid., p. 22.

[57] Ibid., p. 22.

Fee title could be acquired for:

1. Lands for reservoir construction and operation,

   a. Lands necessary for permanent structures.

   b. Lands below the maximum flowage line of the reservoir including lands below a selected free board where necessary to safeguard against the effects of saturation, wave action, and bank erosion and to permit induced surcharge operation.

   c. Lands needed to provide for public access to the maximum flowage line as described in paragraph 1b, or for operation and maintenance of the project.

2. Additional lands for correlative purposes. The fee title will be acquired for the following:

   a. Such lands as are needed to meet present and future requirements for fish and wildlife as determined pursuant to the Fish and Wildlife Coordination Act.

   b. Such lands as are needed to meet present and future public requirements for outdoor recreation, as may be authorized by Congress.

3. Easements in lieu of fee title may be taken only for lands that meet all of the following conditions:

   a. Lands lying above the storage pool.

   b. Lands in remote portions of the project area.

   c. Lands determined to be of no substantial value for protection or enhancement of fish and wildlife resources, or for public outdoor recreation.

   d. It is to be the financial advantage of the Government to take easements in lieu of fee title.[58]

In summary, the Corps and Bureau are authorized by statute to acquire that land which is required for primary reservoir purposes with recent court decisions setting a precedent for additional land being purchased for recreational

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[58] Joint Policies of the Departments of the Interior and of the Army Relative to Reservoir Project Lands, F.R. Document 62-1906; Filed, February 21, 1962, Department of the Army and Interior.

purposes. As of 1962, lands may be acquired for recreation purposes as authorized by Congress. Public land in reservoir areas is controlled by fee simple ownership and private land is controlled by easement if it is located below the maximum flowage line.

The control of private land in these areas is the responsibility of state and local governments. In the case of Tuttle Creek Reservoir, a Corps project near Manhattan, Kansas, the conservation pool of the reservoir is 1,075 feet above sea level. Land is acquired in fee to 1,101 feet above sea level and an easement is retained from the 1,101 foot level to a 1,140 foot level.[59] Above this elevation, no land is controlled by the Corps other than what is required for access. (See Plate III for conservation pool and maximum flood areas.) All other land contiguous to the reservoir is in private holdings or state and local public holding. The proper development of land around the reservoir in private ownership is of utmost importance.

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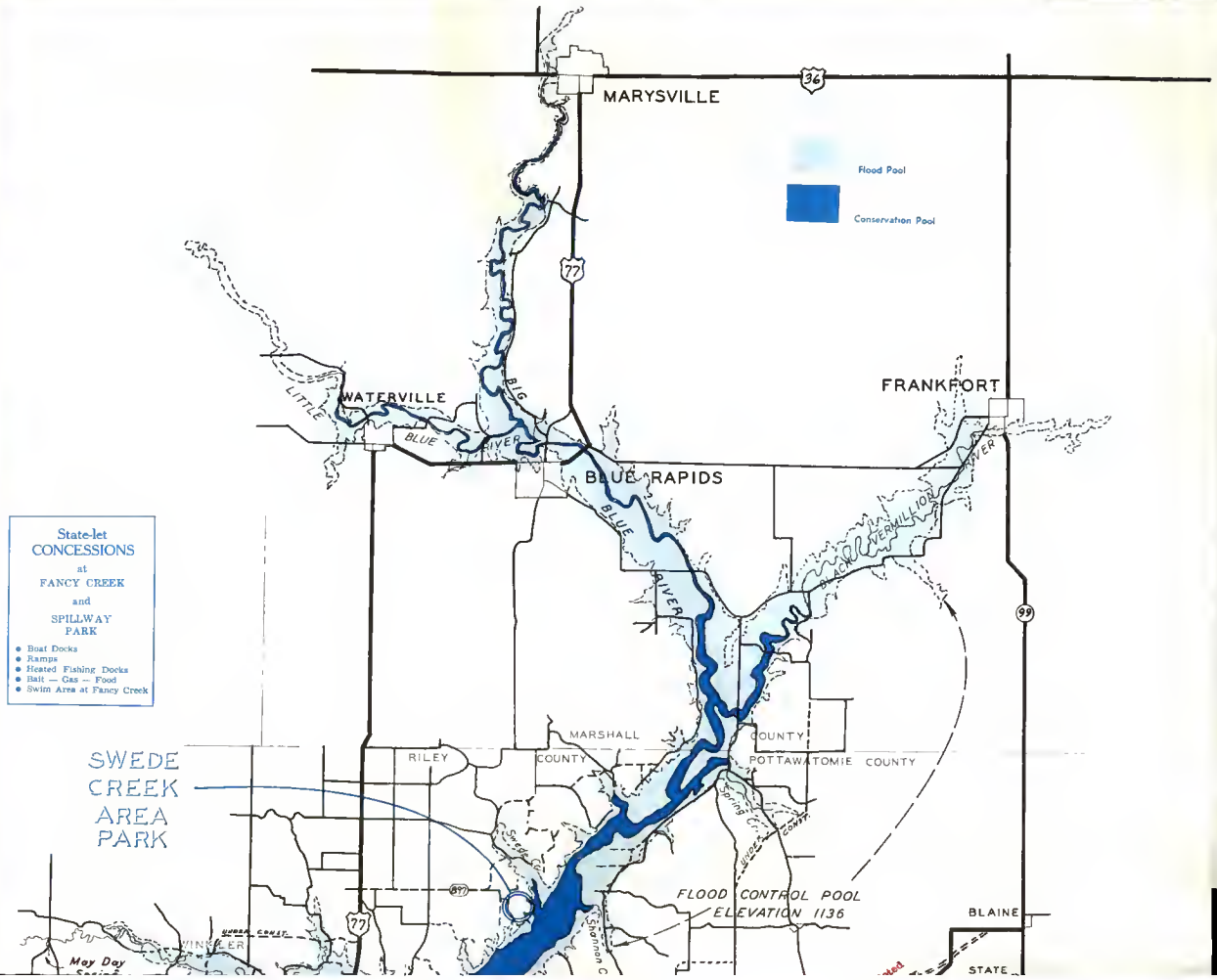
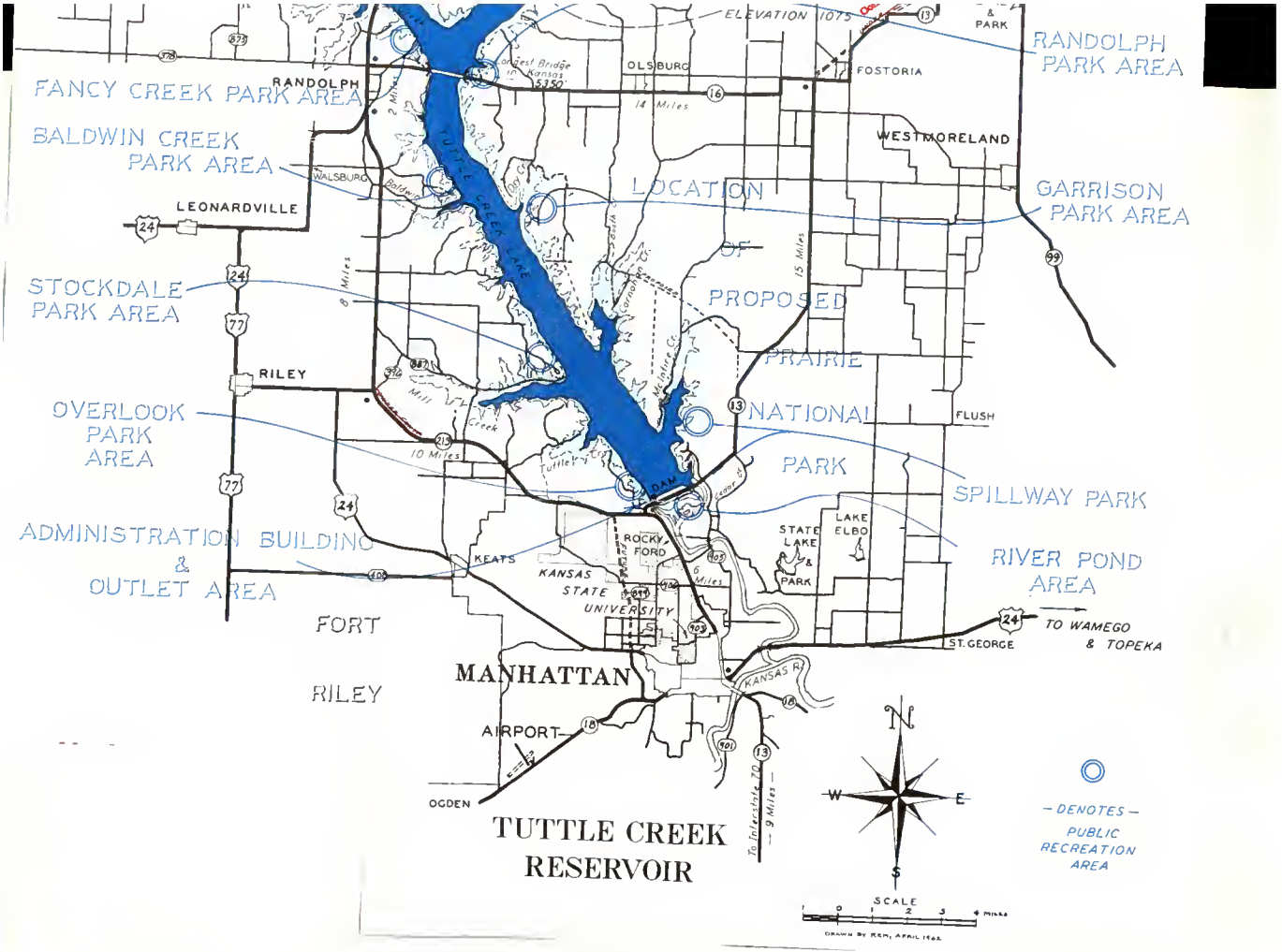
[59] Master Plan for Tuttle Creek Dam and Reservoir Blue River, Kansas, Design Memorandum No. 18 A, U.S. Army Engineer District, Kansas City Corps of Engineers, p. 2.

EXPLANATION OF PLATE III

Map of Tuttle Creek Reservoir and vicinity revealing conservation and flood pool areas of the reservoir.

PLATE III


MARYSVILLE
36
Flood Pool
Conservation Pool
77
WATERVILLE
LITTLE BLUE RIVER
BIG BLUE RIVER
FRANKFORT
BLUE RAPIDS
VERMILLION RIVER
99
State-let CONCESSIONS at FANCY CREEK and SPILLWAY PARK
Boat Docks
Ramps
Heated Fishing Docks
Bait — Gas — Food
Swim Area at Fancy Creek
MARSHALL COUNTY
RILEY COUNTY
POTTAWATOMIE COUNTY
SWEDE CREEK AREA PARK
FLOOD CONTROL POOL ELEVATION 1136
BLAINE
STATE


RANDOLPH PARK AREA
FANCY CREEK PARK AREA
BALDWIN CREEK PARK AREA
STOCKDALE PARK AREA
OVERLOOK PARK AREA
ADMINISTRATION BUILDING & OUTLET AREA
FORT RILEY
LOCATION OF PROPOSED PRAIRIE NATIONAL PARK
GARRISON PARK AREA
SPILLWAY PARK
RIVER POND AREA
TO WAMEGO & TOPEKA
RANDOLPH
FANCY CREEK PARK AREA
OLSBURG
FOSTORIA
WESTMORELAND
WALSBURG
LEONARDVILLE
RILEY
FLUSH
ROCKY FORD
KEATS
KANSAS STATE UNIVERSITY
STATE LAKE & PARK
LAKE ELBO
ST. GEORGE
MANHATTAN
AIRPORT
KANSAS R.
OGDEN
TUTTLE CREEK LAKE
DAM
ELEVATION 1075
Longest Bridge in Kansas 5350
2 Miles
14 Miles
8 Miles
10 Miles
15 Miles
6 Miles
9 Miles
To Interstate 70
N
W
E
S
SCALE
0 1 2 3 4 Miles
DRAWN BY REM, APRIL 1962
– DENOTES – PUBLIC RECREATION AREA
TUTTLE CREEK RESERVOIR

Land Acquisition Policies of the TVA

The Congress has granted broad powers to the TVA for the acquisition of land by purchase or condemnation for carrying out TVA purposes. The TVA places the emphasis on equitable treatment of the individual in the acquisition of land and takes the position that the landowner should be at least as well off after the acquisition as he was before.

It is stated in the TVA appraisal manual that:

> The Authority offers to purchase the lands and rights it needs at prices which will enable the owners, if they have to move, to relocate and re-establish themselves in situations which will afford them advantages at least equal to those they now enjoy; or if they do not have to move to make such readjustments and replacements as are necessary to the continued use and enjoyment of their properties without impairment of their economic positions. It is the policy of the Authority to cooperate with and assist the landowner and not to take advantage of distressed financial conditions or seek to buy lands or rights at minimum prices.[60]

If the TVA is unable to buy private property at its appraised value, the land is condemned and the condemnation cases are heard by a three-man commission, selected by a U.S. District Judge. The three-man commission inspects the property and hears evidence presented by the TVA and the landowner. The Commission then attempts to establish the value of the property being taken by condemnation on the willing buyer-willing seller concept.[61]

The TVA has followed different policies in the amount of land acquired for reservoir sites. During the early 1930's, wide areas of land adjacent to

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[60] Great Plains Council Publication No. 9, op. cit., p. 10.

[61] Ibid., p. 10.

the future lakes were acquired. This was due to the particular needs of the times; farm income was low and lands adjacent to reservoirs were classed as sub-marginal for agricultural purposes. The policy was to encourage forestry and recreational developments and discourage agricultural uses of land.

When the first TVA dam (Norris) was being constructed, a large protective belt was acquired around the lake. These large areas were acquired to gain control of the land for program purposes as well as protect some sub-marginal land from erosion.[62]

The TVA land acquisition program has changed since the initial phases of the program. Current policies are to purchase a smaller amount of land and acquire easements for additional reservoir operations.

In the construction of Fort Loudoun Reservoir, the TVA followed a policy of purchasing in fee only the minimum acreage needed for primary reservoir purposes plus selected areas for public access. Flowage easements were acquired for land which was subject to occasional flooding. Easements permitted the title of the land to remain in the hands of the original owners but reserved the right to flood these areas. This method of acquisition was found to be an unsatisfactory method for recognizing and adapting to new uses of the reservoir.[63] It should be noted that the Corps of Engineers and Bureau of Reclamation Policies have closely paralleled those policies followed in the acquisition of land for Fort Loudoun Reservoir.

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[62] Ibid., p. 20.

[63] Outdoor Recreation for a Growing Nation, op. cit., p. 20.

In one instance, the TVA, the Department of the Interior, the State of North Carolina and Swain County entered into a four-way contract. Under the terms of this contract, the TVA acquired the land and transferred it to the Department of the Interior to become a part of the Great Smoky Mountains National Park. The TVA and the state paid the county for a road that was abandoned, stipulating that the money should be used to retire the county's road bonds. The TVA avoided a construction expense for a new road and the nation gained an enlarged national park.[64] The TVA has entered other formal land acquisition and transferral agreements with other state and federal agencies which have produced many benefits for the public.

Reservoir land acquisition policies have varied but they have never departed from the principle of including lands for public access. TVA reservoir lands are usually open to the public for outdoor recreation subject to the primary purposes of the reservoirs.[65]

The land acquired for reservoirs includes the amount required for normal operating pools plus a "freeboard" acquired in fee simple ownership or flowage easement to handle special situations arising in water control system operations.[66] This "freeboard" usually varies with each reservoir situation. Norris Reservoir has a "freeboard" of 22 feet whereas Wheeler Reservoir has a "freeboard" of 4 feet. Generally this ranges from 5 to 10 feet.[67]

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[64] Ibid., p. 20.

[65] Ibid., p. 6.

[66] Melton Hill Reservoir Comprehensive Plan for Land Use Development, Tennessee State Planning Commission, p. 10.

[67] Outdoor Recreation for a Growing Nation., op. cit., p. 35, 49.

The TVA follows the policy of selling all surplus lands as soon as it is clear that no program requires the further retention of the land as authorized by Section 31 of the TVA Act of 1933, as amended. Surplus lands are determined by the Authority and then offered for sale at a public auction for a specific purpose if a sound consolidated pattern of development is proposed for the land. There may or may not be restrictive covenants included as a condition of sale enforcing continued use of property for a specific purpose.[68]

If certain tracts of land have unusual possibilities for recreation and little value for other uses, it may be sold either at public auction or through negotiation authorized by Section 4KA of the TVA Act. A special clause of this Section provides that the government may re-enter and repossess the property in the event the property is not used for the purposes for which it was sold.[69]

Under the provisions of Section 4KA, 231,562 acres, or nearly one-fourth of the total land acquired for reservoir purposes, has been conveyed or has been reserved for future conveyance to federal, state, and local public recreation agencies.[70] Under another section of the Act, 147,000 acres of surplus land have been sold with much of it being used for commercial and private recreation.[71]

The following table accounts for all reservoir lands which the TVA has acquired, still retains, and has disposed of:

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[68] Great Plains Council Publication No. 9, op. cit., p. 23.

[69] Ibid., p. 23.

[70] Outdoor Recreation for a Growing Nation, op. cit., p. 9.

[71] Ibid., p. 9.

Table 2. Acquisition, retention, and disposal of TVA land in acres.[72]

	Acres
Reservoir land acquired in fee	990,130
Required for reservoir operations and other TVA needs	610,332
Sold	146,970
Transferred to federal agencies	120,122
Transferred to state and local agencies	49,651
To be transferred to federal agencies	15,360
To be transferred to state and local agencies	46,429
Declared surplus for sale	1,266

Within a framework of TVA-state-local relationships, TVA property has been transferred in fee for state, county, and municipal parks, for state-operated game management and public shooting areas, and for areas to serve broad conservation purposes including recreation.[73]

Whenever land is sold for agricultural or forestry purposes, the TVA retains a public right-of access 250 feet wide along the shoreline for recreation and fishing which does not permit overnight occupancy or erection of improvements.

In summary, the TVA acquires land and land rights for reservoir projects to serve primary purposes of navigation, flood control, and power. It also purchases land to insure public access. It does not buy land for agriculture,

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[72] Ibid., p. 23.

[73] Ibid., p. 7.

forestry, recreation, industry and other secondary uses. It sells land to private enterprise and transfers it to federal, state and local agencies.

ECONOMIC IMPACT OF RESERVOIRS

Economic Phases of Reservoir Development

Ivan M. Lee, in his report to the Outdoor Recreation Resources Review Commission, states that a reservoir has a local economic impact. This impact is experienced in five phases of development which do not always follow in order and often overlap.[74]

1. Land speculation. This period possibly begins as soon as the dam is authorized or even earlier. When the government begins to purchase land and final plans are drawn, speculation rises in intensity with land owners holding each property at high prices.

2. Construction. A large construction payroll expended in local communities increases the retail trade. The construction phase of reservoirs usually lasts from 4 to 5 years. After this period, payroll declines and workers leave which often results in a slump of local commercial activity. Although this period of increased economic activity is good for the local economy, local governmental services also have to be increased to serve the additional workers. If a new school has to be provided, the local population may feel the effects of a bond issue ten to twenty years later, after the additional population has left the community.

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[74] Economic Studies of Outdoor Recreation, Report 24, Outdoor Recreation Resources Review Commission, p. 108.

3. Recreation. Growth of recreation may offset the economic slump after construction of the reservoirs are completed. Recreation business grew slowly around older lakes; around lakes constructed more recently, recreation activity has started in boom-like proportions with limited fishing camps. More elaborate facilities have followed later, costing $30,000 to $200,000 per unit.

4. Nearby towns. Communities near the lake experience a shift away from an economy devoted to serving a farm income economy to one serving the needs of visitors who have an urban point of view. The urban visitors expect services and goods equal to urban standards. Newcomers arrive and start new enterprises or purchase old ones. Demands for civic improvements are experienced. In short, a basic shift in the economy may be experienced which may also be true for the social and political structure of the town.

5. Homesite development. Newcomers attracted by the lake and its recreational opportunities begin home construction adjacent to the lake. In the past, these homes have been mostly the vacation type cabin familiar on the older lakes in the Midwest and the East. Home construction is tending to become the more permanent year-round type. People living in nearby cities desire a second permanent home near the lake. An increasing number of these homes are being built by retired or semi-retired couples who want to reside permanently by the lake. The development of homesites around reservoirs will create a new community which will be an urban area devoted to recreational and residential purposes. This type of development may be more important in the long run than recreation development.

Impact from Recreation and Development Adjacent to Reservoirs in Oklahoma

Local governmental units experience an impact from the establishment of reservoirs and the development of recreation. There is a swiftly rising demand for construction of new facilities such as new roads and water and sewer systems near reservoirs. Additional revenue to meet these needs is difficult to obtain. When recreation becomes an important business, retail trade rises which generates an increase in sales tax revenues. However, these revenues collected by some states, which include Kansas, Oklahoma and Arkansas, are distributed back to local governments on the basis of need rather than on the basis of where the tax was collected. Therefore, an increase of sales tax revenues from recreation facilities does not directly aid the local governments in meeting rising costs from providing facilities adjacent to reservoirs, although the state is benefited as a whole.[75]

There are two other sources of increasing revenues due to the construction of reservoirs: (1) an increase in property values adjacent to reservoirs generates a rise in tax revenues, and (2) the counties receive a percentage of the sum paid by lessees to the Corps of Engineers for the privilege of operating concession such as fishing docks and marinas. This latter source of revenue actually becomes a payment in lieu of taxes. Land is lost to the tax rolls when the government acquires land for a reservoir which in turn causes a loss in revenue. The Federal Government, recognizing that some subsidy to this lost revenue should be

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[75] Ibid., p. 148.

provided, returns 75 percent of the revenue from concession and other types of leases. This payment is distributed by the states to counties that have suffered the loss of revenue from property taxes.[76]

Table III reveals the amount of revenues received from these payments for five reservoir areas in Oklahoma.

Table III. Impact of reservoirs on county revenues.[77]

Reservoir	County	Acres bought for Reservoir	1st year tax loss to county	2nd year revenue from leases	1959 revenue from leases	Average revenue
Texoma	Bryan	27,419	$ 7,450	$ 760	$14,350	$ 9,655
	Marshall	60,220	16,500	3,500	24,700	21,558
	Johnston	27,366	7,400	3,120	10,400	9,521
	Love	19,247	5,250	1,850	9,200	7,195
Ft. Gibson	Cherokee	13,419	4,500	5,510	12,150	8,783
	Wagoner	39,177	13,500	16,700	26,710	25,693
	Mayes	17,063	6,000	31,750	41,300	36,057
Tenkiller	Cherokee	23,706	4,500	3,710	8,420	5,863
	Sequoyah	2,849	500	650	3,870	3,100
Norfolk	Baxter	33,000	2,600	2,985	10,150	9,330
Bull Shoals	Baxter	4,900	550	3,815	6,445	5,623
	Boone	13,000	1,500	7,630	15,190	10,876
	Marion	43,200	4,900	8,770	18,215	13,091

This table reveals that the average revenues from leases in all counties are greater than the first year tax loss to each of the counties. It is quite

[76] Ibid., p. 148.

[77] Ibid., p. 149.

apparent that tax losses to these counties are more than offset by lease payments of the Federal Government.

The increase in county revenues from a rise in property values in terms of dollar value is the most important result of development near these reservoirs. The rises in valuation of taxable property results in an increase in taxes which are collected. This increase could be even larger if counties would undertake a general reassessment of property to reflect the rise in value that occurs near the reservoirs. Table IV indicates the gains in taxes in reservoir counties as compared to gains in non-reservoir counties.

Table IV. Property tax levied for county purposes, 1945 and 1956, with percent of change, selected Oklahoma counties.[78]

		1945	1956	Percent Change
TEXOMA AREA				
Group I				
	Marshall	$ 46,236	52,521	13.6
Group II				
	Johnston	33,962	57,690	69.9
	Love	27,322	55,775	104.1
Group III				
	Bryan	122,473	185,188	51.2
Group IV				
	Jefferson	105,166	98,157	- 6.7
	Choctaw	78,875	101,930	29.2
NORTHEAST OKLAHOMA AREA				
Group I				
	Delaware	40,744	67,683	66.1
	Cherokee	50,342	82,230	63.3
	Wagoner	57,493	103,489	80.0
Group II				
	Sequoyah	75,285	109,091	44.9
Group III				
	Mayes	70,682	145,140	105.3
Group IV				
	Haskell	48,828	57,002	16.7
	Latimer	69,826	56,971	- 18.4
RESERVOIR COUNTIES Total, Groups, I, II, and III		524,539	858,807	63.7
NON-RESERVOIR COUNTIES Total, Group IV		302,695	314,060	3.8

[78] Ibid., p. 150.

The table reveals that the reservoir counties as a group have experienced a 63.7 percent gain in taxes levied for county purposes while the non-reservoir counties as a group experienced only a 3.8 percent gain. In that period, school taxes were up 296 percent in the reservoir counties, compared with 190 percent in the non-reservoir counties. There has also been a steady annual increase of investment in overnight accommodations from an initial investment in 1945 of $1.4 million to the 1959 total of $20.8 million in the counties with reservoirs.

This study of reservoirs in Oklahoma, revealed that the most frequently cited complaint against local governments was the need for more and better roads to points on the lakeshore. The roads of the Corps of Engineers are well-constructed and maintained. The roads that are troublesome are the ones leading from highways to reservoir areas.[79]

A subcommittee appointed by the Missouri Basin Inter-Agency Committee to examine this situation concluded that comprehensive economic surveys would be necessary to try and justify the roads as self-liquidating over the long run. Ivan M. Lee suggests that the initial cost of roads to the reservoir should be included in the costs of the reservoir project where county authorities agree to maintain them in good repair.[80] This would necessitate a review of the present Corps of Engineer policy which seeks to maximize recreation responsibilities of state and local government.

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[79] Ibid., p. 152.

[80] Ibid., p. 152.

Economic Impact of Three Nebraska Reservoirs

Edgar Z. Palmer of the University of Nebraska, studied the recreational aspects of three lakes in Southwest Nebraska in 1960. These lakes, Enders, Swanson, and Strunk, attract 2/3 of their visitors from 19 counties in Nebraska, Kansas, and Colorado.

The author concludes that:

> almost $1.4 million is spent annually in the area in connection with recreation at the lakes, plus about $1.2 million spent elsewhere. The $1.4 million generates additional derivative businesses of up to $2 million in the lakes area. The $1.4 million spent locally probably provides work for about 50 persons directly, plus another 70 indirectly, based on the derivative benefit. This means that about 300 persons, including families of workers, are supported by the recreation business generated by the lakes. [81]

The author states that recreation is not the only possible economic benefit from the lakes. The prospects of establishment of industry, schools, other institutions, wholesale distribution offices and warehouses, and governmental branch offices are enhanced by the location of the lakes. These facilities bring in money from outside sources and add to the economic welfare.

Recreational and Economic Impact of Kansas Reservoirs

The present attendance at major reservoir projects in Kansas is approximately 2.5 million visitor days annually. This attendance figure is expected to be over 6 million by 1970 and over 8 million even if there is no relative increase

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[81] Edgar Z. Palmer, Recreational Aspects of Three Nebraska Lakes, Nebraska University Bureau of Business Research Community Study No. 3, p. 2.

in the visitor-day per population-potential ratio.[82] Attendance may surpass these estimates by 50 to 100 percent due to the increase of interest in recreational activity. The recreational radius of a reservoir appears to be at least 100 miles. Thus, the impact of recreational aspects alone will extend over nearly all of the state which will increase commercial activity and retail sales for boats, motors, gas and all water recreational equipment.

An important economic and social benefit derived from reservoirs in the future, if utilized, is water conservation storage. The Federal Water Supply Act of 1958 provides that federal multi-purpose reservoir projects may be utilized for municipal and industrial water supply storage if a non-federal entity provides assurance that future use and repayment will be made. The Kansas Water Resources Board has recommended that the state participate financially in the development of conservation storage in reservoir, watershed, and certain phases of flood control features of watershed projects. Legislative approval of these recommendations were indicated by the passage of House Concurrent Resolution No. 5 which informed the Corps of Engineers that it supported the addition of water supply storage in five major reservoirs. This resolution assured the Corps that the state or its political subdivisions would repay the cost of such storage in Milford, Perry, John Redmond, Elk City, and Council Grove Reservoirs.[83]

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[82] A suggested Water Development Program for Kansas, Publication No. 243, Kansas Legislative Council Research Department, p. 24.

[83] Ibid., p. 3.

The nature of benefits derived from additional emphasis on water storage are increased water recreational opportunity and an assurance of improved water supply conditions along the major water courses of the state. Earlier considerations concerning the purposes of Corps reservoirs in Kansas proposed that some of the reservoirs would not retain a conservation pool and all storages would be governed solely by flood control requirements which included no storage for low flow, irrigation or other purposes. Water storage allocations in federal reservoirs will increase the insurance that there will be adequate flow of water in the main water courses of the state. This will be a benefit to cities using water from these courses for their municipal supplies and will provide a stimulus for added economic growth. Other areas not adjacent to main water courses could use water from these reservoirs by utilization of pipelines. For example, the City of Wichita is constructing a water line from Cheney Reservoir to its city limits. An adequate supply of water is a prime requisite for life and its activities. The provision for water supply storage in the federal reservoirs of Kansas will assure a water supply for present and future use.

Wilfred Pine and Homer B. Fletcher of Kansas State University undertook a case study of Kanopolis Reservoir and federal payments received in lieu of taxes in 1954. The payments received by the local governments involved were 75% of the total revenues collected by the Federal Government. The study revealed that townships and school districts received considerably more lease revenue than the estimated loss in taxes from years 1943 to 1953. During this time, the county and state received less than the estimated loss in taxes.

However, aggregate payments in lieu of taxes to the state and all local entities were adequate to replace lost tax receipts from the period of 1943 to 1953.[84]

It is sometimes difficult to determine the benefits derived from reservoirs in specific monetary values. The benefits occurring from flood control can be roughly estimated. It is more difficult to estimate the economic benefits which are or will be received from recreational activities at reservoirs. The construction of federal reservoirs has enabled the Kansan to participate in water recreational activities to a much greater extent than he could have previously. The social and psychological benefits received from these activities are nearly impossible to quantify.

EXISTING PROBLEMS IN RESERVOIR SHORELINE DEVELOPMENT AND THE NEED FOR ACTION

Experience has revealed that when water is impounded, new demands arise for use of land adjacent to the lake. The public will want to utilize the lake for recreational purposes; this requires adequate provision for public access. There may be residential, commercial and industrial land use demands of varying intensity. Development may occur which will require the facilities and services that a small city needs for existence. Conflicts could arise in the demand for various land uses with resulting misuse of land. Sanitary, as well as land misuse, problems could occur; thus, there is a need for sound planning and

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[84] Wilfred H. Pine and Homer B. Fletcher, Payments in Lieu of Taxes Kanopolis Reservoir Project, Kansas -- A Case Study, Kansas State Agricultural Experiment Station, Bulletin No. 78, February, 1955, p. 1, 2.

zoning techniques and workable plans for provision and financing of public facilities.

Demands for Recreation and Public Access

Some remarks concerning the recreation and resort demands of a lake near Gainesville and Metropolitan Atlanta were made by Sylvan Meyer in 1958. These remarks are summarized below.

A horde of visitors every weekend jams highways leading to the lake. These people could be a great resource in tourist income and in summer residents if facilities are available for them. There are no subdivision and sanitary regulations. What will happen when each of the 50,000 lots will contain a septic tank? None of the counties in which the reservoir lies require a building permit. Many of these lots are only 50 feet deep. Near Gainesville last week, several lots of 2,500 square feet on the lake sold for $1,000 each. Soon building codes and subdivision regulations will help control the area within the city limits of Gainesville.[85] This is illustrative of recreation and resort demands of other metropolitan areas.

According to the estimates of the Outdoor Recreation Resources Review Commission, 73 percent of the people in the United States will be living in metropolitan areas by the year 2000; in 1960, this figure was 63 percent.[86]

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[85] Sylvan Meyer, "Influence of Metropolitan Atlanta in the Upper Chattahoochee Valley Area", Sou'easter, August-September, 1958, p. 31.

[86] Outdoor Recreation for America, Outdoor Recreation Resources Review Commission, p. 30.

The Commission predicts that there will be 230 million people in the United States by 1976 and 350 million by 2000. Recreation demands will double or more by the year 2000, and studies indicate that the individual will be participating more in recreation than he presently does.

Incomes will be higher with disposable consumer incomes rising from $354 billion in 1960, to $706 billion by 1976, and to $1,437 billion by 2000. More people will move into higher income brackets. In 1957, nearly 14 percent of the consumer units experienced incomes of $10,000 or more. In the value of 1959 dollars, it is estimated that this proportion will be 40 percent by 1976, and possibly 60 percent by 2000.[87]

There is likely to be an increase in outdoor activity with an increasing affluent economy. More people will be able to afford to participate in outdoor recreation which would include sightseeing, boating and water skiing.

People will have more free time. In 1960, the average industrial force work-week was 39 hours. By 1976 and 2000, this is estimated to be 36 and 32 hours respectively. The chief barriers to recreational activity according to the O.R.R.R.C., are the lack of time most importantly, and then the lack of money. As people acquire more of both, there will be an increase in per capita demand for recreation. With this demand applied to an increasing population, a multiplying effect could be experienced.

The population should become more mobile. The number of passenger cars is estimated to be 100 million by 1976 which would be an increase of nearly 80 per

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[87] Ibid., p. 30.

cent above the 1959 figure. The increase in air passenger miles is expected to increase nearly from 30 billion miles in 1960 to 150 billion miles in 1976 and 325 billion in 2000.[88]

In summary, these O.R.R.R.C. studies reveal that outdoor recreation during each Summer may increase from the present 4.4 billion separate outdoor recreation "activity occasions" to 6.9 billion by 1976, and 12.4 billion by 2000. An "activity occasion" is participation by an individual in a single recreational activity during a day.[89] These estimates indicate that participation in outdoor pursuits will nearly triple in 40 years.

Water is an exceptional stimulus to recreational activities. Reservoirs have brought water-based recreation to many people in the arid and semi-arid west, and thus affected the general pattern of recreational activity in these areas. People living in these areas never counted on boating as recreation in their life activities. With the construction of more Corps of Engineers and Bureau of Reclamation Reservoirs, these people will probably become the most avid boaters in the United States.

The figure for visitor-days at Corps, Bureau, and TVA reservoirs exceed that of attendance at national parks and forests in 1960. Corps, Bureau, and TVA reservoirs received 109 million, 23 million and 42 million visitors respectively in 1960. The national rate of growth in the use of all federal reservoirs for

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[88] Ibid., p. 31.

[89] Ibid., p. 32.

recreation has exceeded 10 percent annually. This figure for reservoirs in the Southwest from 1950 to 1958 was 159 percent.[90]

The Kansas State Park and Resources Authority announced that the number of lake-visitor-days for five federal reservoirs in Kansas, has increased from 308,217 to 514,130 in the past year, from May 31, 1962 to May 31, 1963.[91] With the completion of the other federal impoundments in Kansas, the number of visitor-days is expected to increase in the future.

Reservoir land administration, starting with acquisition, extending through planning and administration to ultimate disposition, is the key to securing public recreation benefits from multi-purpose reservoir development. No matter how inviting a reservoir may be for swimming, boating, fishing and other water sports, it is of no value to anyone who cannot acquire access to it. Access to the reservoir and space for facilities and improvements which permit access are controlled by the ownership and development of the land adjacent to the shoreline.

Previous to great public pressures to use multi-purpose reservoirs for recreation, the developing agency could rely on simple flowage easements to accommodate the needs of flood control, navigation, or power. The American people are now demanding access to their reservoirs for recreation and the question of who controls access to the shoreline is of greatest importance. If the agency developing a reservoir does not require adequate amounts of land along its shoreline, private interests will eagerly attempt to do so. The public

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[90] Ibid., p. 179, 180.

[91] Manhattan Mercury, June 23, 1963, p. 1.

may lose substantial recreational values resulting from the expenditure of public funds.

One of the earlier studies which exemplified the need for public access to an inland lake was undertaken by the New Hampshire Planning and Development Commission.[92] This study, completed in 1949, was concerned about Lake Winnipesaukee's recreation use and potential. It recognized that the Lake was entirely deficient in areas for public use. The shoreline was privately exploited to such an extent that the general public had little opportunity to enjoy it. The lake was accessible at several points to boats, but uses such as camping, swimming and picnicing were all but prohibited to the general public. Only one percent of the total shoreline was available to general public use and nearly all of this was in one of the eight towns adjacent to the lake.[93] Nearly all of the shoreline had potential recreational development. Two-thirds of this was already privately developed with commercial properties, boys' and girls' camps and summer homes. The remaining one-third of the privately owned shoreline was still undeveloped. This study, in the 1940's, recognized the need for developing the remaining shoreline so that the public could benefit from it. The study recognized that private property owners had the responsibility to properly develop the lakefront, but recommended that state and local government must do everything possible to protect the public interest. The proposed areas of responsibility of those two governmental groups were as follows.

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[92] A Study of the Lake Winnipesaukee Shore Line, New Hampshire State Planning and Development Commission, p. 9.

[93] Ibid., p. 9.

1. Those which are the responsibility of local government: Zoning and subdivision control; recreational road construction and maintenance; refuse collection; assessment and property tax policies; the review of the status of public landings, rangeways, rights-of access; legal location of town lines.

2. Those recommendations which are a responsibility of state government: Provision of public recreation areas; development of navigation facilities; clarification of laws pertaining to the rights of public to the use of lake shore below mean high water; legislation needed to carry out the recommended program; the feasibility of a canal to connect portions of the Lake.[94]

W. M. Baker, Recreation Consultant of Toronto, reviewed the fantastic expansion of outdoor recreation movement in Canada, and the resulting demand for public access to natural recreation facilities at the American Society of Planning Officials Planning Conference of 1959. He found that the shoreline of lakes that were freely used by the public for swimming, picnicing and hiking are now rimmed with private cottages, institutional camps, and other recreation developments.[95]

Recreational growth on TVA lakes clearly demonstrates the need for public access to the shorelines. Table 5 indicates the recreational growth on all of the TVA lakes from 1950 to 1959.

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[94] Ibid., p. 32.

[95] Ibid., p. 95.

Table V. Recreation: growth -- all TVA lakes.[96]

	1950	1959	Percentage Increase
Value of facilities on lakes	$20.7 million	$100 million	400%
Number of boats	15,000	48,000	220%
Value of Boats	$ 7,2 million	$ 25.8 million	260%
Number of state parks	10	13	30%
Number of county parks	13	28	115%
Number of municipal parks	15	34	125%
Improvements in state, county and city park facilities	$ 1.5 million	$ 9.4 million	525%
Boat docks, fishing camps, resorts	124	331	165%
Overnight rental accommodations	4,300	10,400	140%
Public access areas (administered by state and local agencies)	0	350	--
Person-day use	13.5 million	40 million	195%

The Tennessee State Planning Commission strongly recommends that state and local governments acquire possible recreation sites adjacent to reservoirs to preserve proposed public use areas. This land would be additional to land acquired by the TVA for reservoir construction.[97]

Due to the acquisition policies of federal agencies in developing reservoirs, much of the land contiguous to reservoir shorelines is in private ownership. All of the larger federal reservoirs in Kansas, are constructed by the Corps of Engineers or the Bureau of Reclamation. As indicated previously, the Bureau

[96] Tennessee State Planning Commission, op. cit., p. 47.

[97] Ibid., p. 69.

and Corps acquire all land flooded at least once every five years or all land within 300 feet horizontally of the "conservation pool." Flowage easements are obtained over lands which may be subject to flooding at intervals in excess of five years. Additional land for access is acquired normally at intervals of five miles along each side of the reservoir. The Corps of Engineers is authorized by statute to construct and permit construction and maintenance of public park facilities which will allow the general public access to the recreational opportunities afforded by Corps reservoirs. The latest policies of the Corps and Bureau with the approval of Congress, provide that additional land may be acquired for recreational uses.

The increase of recreational activity at TVA, Corps and Bureau reservoirs in recent years indicates that adequate provision for public access must be provided to insure that the public may enjoy the lakes which they helped to finance.

Demands for Residential Uses

Reservoir shorelines are becoming increasingly useful for residential purposes as well as for recreation. A study of the Lake Winnipesaukee shoreline in New Hampshire during the 1940's revealed that three-fourths of the developed shoreline contained 1,600 Summer homes. The average amount of shore front per Summer home was 398 linear feet. This development, plus boys' and girls' camps and some commercial development, had pre-empted nearly all of the developed shoreline.

When lots are strung in a continuous belt along an entire shoreline, the occupants themselves limit their own access to the water, as well as the general

public. Usually, not all of the shoreline can be utilized adequately for access to the water due to the topography of the adjacent land. Thus, an owner may have legal access to the lake from his property; however, due to the topography of his lot, he cannot launch his boat. His access to the lake is then as limited as the visitor unless a friendly neighbor permits him access.

There is a rapidly growing number of permanent year-round homes clustering close to shorelines or on nearby access roads. People from Wichita, St. Louis, and Kansas City have purchased land adjacent to Table Rock Reservoir in the Ozarks where real estate activity has been particularly active. Seven parcels of land were sold to residents of Caracas, Venezuela, who were American oil men interested in places to retire.[98]

On the Texas side of Lake Texoma, an exclusive homesite and country club development is attracting houses in the $40,000 to $55,000 category. In 1960, 1,100 lots were sold in the Preston Peninsula area of Texoma with access to the lake. The Corps of Engineers predict that housing activity will continue for some 25 to 30 years before a saturation point is reached in the Texoma area with increasing numbers of these homes being permanent.

The reservoirs in Northeast Oklahoma are experiencing a substantial rise in home construction. Officials of the Grand Lake Association estimated that $12 million worth of homes lined the lake shore by 1958 with $3 million worth being constructed in the two years previous to 1958.

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[98] Outdoor Recreation Resources Review Commission Report 24, op. cit., p. 145.

In the early stages of development around a new lake, there is a strong element of speculation in land purchases. At Table Rock, many units were four to five acres in size; the owner probably hoped to build on a portion of the lot and sell the remaining space at a profit.

Some land purchasers may be semi-retired or fully retired. Most homesite developments are constructed by middle and higher income retirees in the $20,000 cost category.[99]

Over 8,000 families have built residences valued at nearly $525 million on TVA lakeshores. Prices paid for lakefront lots near population centers continue to rise. A two-acre lot in a TVA subdivision adjacent to Chickamauga Reservoir sold for $20,000 in 1962. In 1950, this lot sold for $2,200.[100]

There is considerable private land speculation around the newly constructed Tuttle Creek Reservoir near Manhattan, Kansas. As of December, 1963, there were 498 lots platted adjacent to the east shore of the Reservoir in Pottawatomie County. There were 1,420 lots platted adjacent to the west shore in Riley County as of December, 1963. At this time, there was very little home building on these lots. If the home construction trends adjacent to the federal reservoirs in Missouri, Oklahoma, and Arkansas, are experienced at Tuttle Creek Reservoir, many new homes will be constructed in the following ten years.

Tuttle Creek Reservoir is the largest existing or proposed reservoir in Kansas, located in a natural grassland setting which adds to its attractiveness

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[99] Ibid., p. 146.

[100] Annual Report Division of Reservoir Properties, Fiscal Year 1962, Tennessee Valley Authority, p. 17.

for homesites. Manhattan, a city of nearly 30,000 population, is a thriving university city, which is continually growing. Residents of the city who are considering construction of new homes might select a site adjacent to the reservoir. It is possible that the extensive platting being undertaken on the east shore is influenced by the proximity of the proposed Prairie National Park.

All trends of homesite development around federal impoundments indicate that more and more people are seeking summer and permanent homesites adjacent to these facilities. These homes will nearly all be constructed on private property. If local governing bodies whose jurisdiction is adjacent to reservoirs do not effectuate developmental and land use controls, private land developers may utilize their own developmental procedures at will.

Demands for Commercial Use

Water oriented commercial uses such as boat docks, marinas, etc., must of necessity be located along the shoreline to realize the recreational benefits of a reservoir. If they are haphazardly located, they can be very detrimental to all types of neighboring uses.

A most attractive subdivision adjacent to a reservoir can be made garish with signboards, or values can be depreciated by second-class eating places and taverns. Roul Tunley states that due to the absence of zoning or planning around many lakes in Missouri, all types of cabins, dancehalls, hot dog stands, and service stations give a honky-tonk touch to an otherwise beautiful lakeshore landscape.[101]

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[101] Outdoor Recreation Resources Review Commission Report 24, op. cit., p. 146.

W. N. Peach, Professor of Economics at the University of Oklahoma, believes that free enterprise should not be permitted to clutter up at will the best lake sites with hot dog stands, service stations and pinball machines.[102]

The commercial demands of tourists are not the only commercial demands on a lakeshore. If large subdivision develops, there will be need for the commercial services which a small town must maintain. Retail activity such as grocery, clothing and hardware stores could prevail. A demand for personal services might be experienced. A large subdivision adjacent to a lake would experience conflicts between commercial and residential demands for land.

Demands for Industrial Use

In the past, availability of water has determined where man would build his civilization. Water is of even greater importance today because of the demanding needs of man's expanding industrial economy. Shortages of water have been experienced making it more and more important to reuse and conserve the greatest of raw material assets.

Jack B. Graham, co-author of Water for Industry, stated that industry utilizes nearly one-half of all water withdrawn for use in the United States and that industrial water use between 1950 and 1975 will double.[103] Mr. Graham believes that the geographic location of heavy water consumptive industries is relatively stable with some probable expansion into new areas south of the Ohio

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[102] Ibid., p. 146.

[103] Water for Industry, Publication No. 45, American Association for the Advancement of Science, p. V.

and Potomac River Basins and east of Kansas.[104] Some of this expansion has and is being experienced in the Tennessee River Valley.

The industrial potential of reservoir shorelines was scarcely recognized until the Korean War. During this period of time, the Bowaters Southern Paper Corporation became a huge industrial plant of the Chickamauga Reservoir.[105] This corporation has now purchased or leased other land on other reservoirs for concentration yards to store pulpwood.

As of 1962, there were approximately 150 waterfront plants along the Tennessee River waterway worth $854 million.[106] There are approximately 53 excellent waterfront industrial areas remaining in Tennessee, located on nine-foot draft channels of the Cumberland, Mississippi, and Tennessee waterways. These prospective plant sites are located above the elevation of known maximum regulated floods, near highways and railroads, and on reasonably level land. Water transportation is a major asset to potential industrial sites. Plate IV indicates Tennessee's navigable waterways and how they are related to the interconnected inland waterway system of the United States. Large quantities of water are available for cooling, processing, waste disposal and other uses important to industry; this water is provided by the systems of reservoirs along the Tennessee Waterways.

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[104] Ibid., p. 27, 28.

[105] Outdoor Recreation for a Growing Nation, op. cit., p. 22.

[106] A Program for the Preservation and Development of Industrial Areas Along Tennessee's Waterways, State-Local Waterfront Industrial Site Committee, p. 7.

EXPLANATION OF PLATE IV

Map of Tennessee's Navigable Waterways and Their Relation to the navigable waterways of the Eastern Half of the United States.

PLATE IV

TENNESSEE'S NAVIGABLE WATERWAYS AND THEIR RELATION TO THE INTERCONNECTED INLAND WATERWAY SYSTEM

The possibility of heavy industry locating adjacent to federal reservoirs in Kansas is negligible. The main watercourses in Kansas are relatively unnavigable; the tributaries to these main streams which contain many of the federal reservoirs are less navigable than the main watercourses. Power is not generated by the damsites. The topography adjacent to Tuttle Creek, the largest reservoir in Kansas, is unsuited for heavy industrial development. However, the reservoirs in Kansas may affect industrial expansion. With storage of water in these reservoirs for low flow stream augmentation, industry located downstream will be guaranteed a sufficient supply of water for their manufacturing processes. For example, an industry utilizing Kansas River water at Topeka will be assured of adequate water due to low flow storage allocations in reservoirs upstream.

It is possible that research type industries could be induced to locate adjacent to federal reservoirs near university centers due to the aesthetic appeal of reservoir sites and the technical assistance available from universities. The employee of an industry located near a reservoir could enjoy the recreational benefits provided by the lake.

Need for Control of Land Adjacent to Reservoirs

The land in public ownership contiguous to reservoirs is controlled by the federal agency which constructed the reservoir, or state and local governments which have acquired or received adjacent land for parks. According to the O. R. R. R. C., the Corps of Engineers policies relating to concessionaires have been quite successful in meeting the desires of a large portion of the

recreation-seeking public while keeping shorelines relatively free of a honky-tonk atmosphere.[107] An outstanding characteristic of recreation at Corps lakes is the limited number of resorts as compared to other lakes which have uncontrolled development.

Around older lakes, when the Corps acquired land above the flood stage previous to 1953-54 land acquisition policy, some land was utilized for home-sites under Corps supervision. Some residential developments adjacent to Texoma and Norfork Lakes on Corps land are attractive with no signs of deterioration.[108]

It appears that the earlier policies of the Corps and the TVA concerning land acquisition for reservoirs have experienced a greater success in controlling shoreline development and providing public access than later policies. It is imperative that the public agency, which acquires land for a reservoir, should acquire adequate space for access.

The control of private land around reservoirs above easement or maximum high water elevations is the foremost problem of controlling development in reservoir areas.

There are two major areas of concern in private development of land adjacent to reservoirs. They are public health factors in residential and other development or subdivision control and proper land use planning with zoning authority.

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[107] Outdoor Recreation Resources Review Commission Report 24, op. cit., p. 136.

[108] Ibid., p. 136.

Land Use Planning and Its Need in Reservoir Areas. Although the most pressing need of reservoir shoreland development is the control of public health factors through subdivision regulations, the need for comprehensive planning precedes the need for subdivision regulations, building codes and zoning. The basic function of planning is to prepare a general plan for the future development of an area. Planning for future development of an area usually involves considerations for future land uses, transportation and public facilities. These components of the comprehensive or general plan are then implemented by zoning rules, subdivision regulations and building codes.

The land use plan is the guide for within each proposal for the use of land can be evaluated with respect to over-all community development. The land use plan should be formulated and kept up to date on the basis of population and economic studies which are the guideposts in determining the amount and nature of future growth. The requirements for future land use needs are determined from these studies and the existing land uses. Estimates are usually prepared for the amount of land needed for residential, commercial, industrial and public uses. It must not be implied that at some pre-determined date there will be a demand for certain amounts of land utilized in a specific manner. Rather, as a community grows, these requirements must be met on a continuing basis with the land use plan serving as the guide to development.

Future land use demands are met by re-ordering existing land uses or utilizing vacant land. An evaluation of assigning these lands to their best use can be made on the basis of the following collection of data.

(1) Compilation of data on physiographic features (topographic mapping)

(2) Existing land use survey

(3) Vacant land survey

(4) Structural and environmental quality survey

(5) Cost - revenue studies of land use

(6) Land value studies

(7) Studies of aesthetic features of the urban area

(8) Studies of public attitudes and preferences regarding land use.[109]

After this data has been analyzed, the land use plan should be completed and articulated with the transportation plan to form the most practical, economical and attractive design for all land uses. This comprehensive planning approach should be applied to lands adjacent to reservoirs.

If future development is guided or planned before it occurs, haphazard growth can be deterred. Subdivision regulations, zoning and building codes can perpetuate an inconvenient or uneconomic growth pattern unless it is pursued under a consistent plan for developing land uses, transportation networks, and facilities such as schools and parks.

There is competition for the use of private land adjacent to reservoirs for various purposes. Home owners want to locate near the shoreline, resort operators seek to operate motels, cottages and restaurants near the shoreline; and operators of bait shops, boats and engines, and water skiing equipment would like to locate near boatdocks. Industries which use large quantities of

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[109] F. Stuart Chapin, Jr., Urban Land Use Planning, p. 191.

water in their processing seek to locate near the shoreline. Industries requiring water terminals, especially along the navigable rivers in the Eastern part of the United States, must be located along river and reservoir shorelines. Farmers want access to the shoreline for stock watering and irrigation purposes.

As indicated earlier, concessionaires and resorts are more numerous around lakes which do not have any form of control over their number or type.[110] These lakefronts take on a cluttered look which most vacationers find unattractive.

Without land use controls, the shoreline homesite owner who purchased a vacant lot with a beautiful view of the lake, may witness the erection of a hot dog stand in an adjacent lot or across the street from his residence. Without a doubt, there will be competition between residential and commercial uses for the best sites adjacent to a reservoir shoreline.

The list which follows is a more complete list of uses that must be reconciled to one another in a reservoir area.

1. Summer cottages or residences (some owner occupied, others rented)
2. Year-around residences
3. Summer resorts (hotels, motels, cabins, boarding houses)
4. Hunting, fishing, gun and riding clubs (in wilderness areas)
5. Combination resorts and hunting camps
6. Boys' and girls' camps
7. Golf courses
8. Beaches (public, private and commercial)
9. Marinas, boat liveries and boat launching ramps
10. Recreation clubs (yacht, boat, beach, gold, country)
11. Amusement parks
12. Tent colonies and auto trailer camps
13. Institutionally-owned facilities (unions, churches, fraternal)[111]

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[110] Outdoor Recreation Resources Review Commission Report 24, op. cit., p. 135.

[111] Water Fronts: Planning for Resort and Residential Uses, Information Report No. 118, American Society of Planning Officials, p. 12.

There will possibly be little competition of industrial land uses with others for shoreline utilization of federal reservoirs in Kansas. The conflicts between the recreationist who seeks to buy gas, oil, bait, food, beer, and other supplies and the lakeside home owner has not developed to a great extent near reservoir shorelines in Kansas. However, past experience at older reservoir sites in other states indicate that these conflicts may occur.

There may be misuse of land adjacent to reservoirs as well as conflicting demands for use. In approaching Tuttle Creek Reservoir from the south on State Highway 13, there is a second-class tavern located near the dam operational headquarters and an adjacent well-maintained state park area. Plate V is composed of photographs of the tavern in its environmental setting.

Need for Subdivision Control. Land subdivision regulations is the guidance of land subdivision development by a public authority. It is a tool to prevent obvious flaws in a subdivision such as excessive street grades, awkward intersections or substandard pavements or utilities. The prevention of these items is an important benefit of subdivision control; however, the real purpose of subdivision control is to insure a successful integration of all land uses and to provide adequate facilities and services for the residents. Subdivision regulations are enforced through power to withhold the privilege of public record from plats not meeting established requirements and standards.[112]

The problems of bad water supply, improper waste disposal, water pollution and poor construction in a reservoir area often overshadow the problems of land use planning.

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[112] International City Managers' Association, Local Planning Administration, p. 345.

EXPLANATION OF PLATE V

Photographs revealing a tavern in its environmental setting south of the Tuttle Creek Dam.

Fig. 1 - Photograph revealing the tavern, picnic area behind the tavern, and the dam in the background.

Fig. 2 - Photograph revealing the tavern, sign and dam in the background.

PLATE V

Fig. 1

Fig. 2

Waste Disposal. Sewage disposal is the most pressing problem in a reservoir area. As development occurs, disposal of sewage is usually inadequately handled by privies, cesspools and septic tanks. It is generally assumed that these types of facilities will be utilized only a few months of the year, and after periods of non-use, they will recover their ability to handle wastes effectively. However, as demand increases for use of lake and resort areas, these types of sewage disposal facilities become overloaded. In the northern lake areas, people had used resort facilities in the summers only; now the areas are also centers for skiing, hunting and otherwinter sports.[113]

Considerable amounts of land contiguous to reservoirs is unsuitable for septic tank use. This is especially true of the landform around Tuttle Creek Reservoir. The subsurface geology of the land consists of layers of limestone and shale making it imperative that individual residential lots with septic tanks are a minimum of one acre in size.[114] Subdivision regulations adopted by Pottawatomie County, the county contiguous to the eastern shoreline of the reservoir, specify that lots must be one acre in size as a condition of sale.

Perhaps the most difficult problem in utilizing individual disposal systems is operation and maintenance.[115] Any individual facility which is installed will tend to receive little maintenance from property owners. The developer, after sale, probably would not have a continued interest in the operation and main-

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[113] American Society of Planning Officials, Report 118, op. cit., p. 30.

[114] Information received during interview from Dr. Henry Beck, Professor of Geology, Kansas State University, April, 1963.

[115] American Society of Planning Officials, Report 118, op. cit., p. 32.

tenance of the individual units. The American Society of Planning Officials believe that group sewage disposal systems are better solutions for this type of development. Most sanitary engineers think that it is possible to design satisfactory group systems that will be relatively economical. The organization of a property owners association or corporation is probably a better way to maintain small group sewage disposal systems in good operating condition. The operation and maintenance of a group sewage disposal system in a subdivision adjacent to a reservoir could be undertaken most adequately by the creation of a special sewer district or by a local governing body. If the operation is in the hands of a public authority, the costs should be financed by a sewer charge.[116]

Water Supply. The provision of an adequate and safe water supply is the second major sanitation problem in reservoir areas. There is a scarcity of ground water in some of these areas. Due to the underlying strata of limestone and shale in the Tuttle Creek Reservoir area, it is extremely difficult to obtain a sufficient supply of water. According to Dr. Henry Beck of the Geology Department of Kansas State University, if each homeowner had to provide his own well, each lot should be one acre in size to provide an adequate supply of water for year-round domestic use. This is not to say that all one-acre lots will contain adequate ground water to supply domestic year-round needs for residents. This is a general standard which should be utilized in this area for size of lots and provision of adequate water supply. A central water supply would serve the needs of reservoir subdivisions much more efficiently and adequately.

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[116] Ibid., p. 32.

Provision of Other Facilities and Services. The primary goal of a land developer is to make a profit. The long range public interest may suffer if the developer has to cut corners to increase his benefits.

In a larger permanent subdivision near a reservoir, land will need to be reserved for schools and parks. Land developers should be required to dedicate land for parks. The developer must provide adequately-designed streets with proper widths and pavement. The street system should be coordinated with county, state and federal reservoir access highways. Street lighting and sidewalks should be provided for the residents. In short, the large permanent subdivision near a reservoir requires the same services and facilities that a small municipality needs.

Sanitation problems concerning the lake itself can arise from the disposal of wastes from various types of watercraft. A pollution problem can arise from the use of boathouses on a reservoir. On the Guntersville Reservoir in Alabama, some owners had installed living accommodations in their boathouses.[117] Wastes from these craft, treated or untreated, should not be disposed of in the lake. The Corps of Engineers prohibits the discharge of sewage, garbage or other pollutants into the reservoir. All pollutants must be deposited ashore at places designed for this use.

The spillage of materials from loaded barges such as oils and oil products can be harmful to fish and recreational craft. These materials may

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[117] Water for Recreation - Values and Opportunities, Report 10, Outdoor Recreation Resources Review Commission, p. 32.

cause unsightly beaches and even damage boats and other gear.

The discharge of industrial wastes into a lake can cause serious pollution problems. Paper plant wastes blacken the water and cause waste products to accumulate along shorelines. Discharged wastes may produce suspended and deposited solids, septic conditions, toxic conditions and higher water temperatures.[118]

Reservoirs which provide water supplies for municipalities will have pollution problems if recreational uses are permitted on the lake. If these uses are permitted, treatment of the water may be necessary. The Cheney Reservoir, a Bureau of Reclamation project under construction, will provide an additional water supply for the City of Wichita. The reservoir will be used for recreational uses; however, the water will be treated before it is consumed by the people of Wichita.

Principles of Reservoir Land Use Planning

Residential Land Use. Summer and year-around residences occupy the largest portion of land around reservoirs. Although each reservoir situation is different, a generalization can be made that a substantial portion of the waterfront should not be subdivided for residential purposes. A portion of the waterfront and the lake itself should be reserved for the public.[119] Residential development should not abut the shoreline so access can be provided to the public.

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[118] Ibid., p. 32.

[119] American Society of Planning Officials, Report No. 118, op. cit., p. 13.

Commercial Land Uses. Such water-oriented commercial uses as boat docks and marinas, require shoreline locations which are directly related to the recreational use of the reservoir.

Commercial uses, such as restaurants, gas stations, food stores, gift shops, theaters and drive-in snack bars, that service the recreation industry and tourists do not require water front locations. They should be located on main access roads to the lake and could be in close proximity to the water-oriented uses.

Good land use development would require that motels, hotels, cabins, clubs, trailer camps and institutionally-owned recreation facilities should be segregated from permanent residences. These could be adjacent to the retail commercial area which serves tourists. It is important that the motel type resort provides adequate and safe parking.

Transportation Land Uses. Traffic and parking problems can become complicated in a reservoir area due to the traffic peaks on weekends and holidays. Good roads should be provided to recreational areas, and when improvements are planned for these roads, consideration should be given to handling of peak loads.

Within the reservoir area, traffic should be diverted away from residential and cottage areas. Principles utilized in designing subdivision road patterns are applicable to design of road patterns in a reservoir subdivision. Traffic should be sent through the most scenic area on the way to the shoreline. Road development must be adequate to provide efficient and safe access to the shoreline.

Sufficient parking space must be provided at boat docks, motels and scenic areas. The parking lot should not be disruptive to the scenic landscape and could be screened from view. Ingress and egress to parking lots should prevent traffic congestion.

Conflict of Uses on the Lake. On lakes utilized for navigation, there is conflict between barge traffic and recreational uses. On narrow navigational reservoirs, private recreational piers, boathouses and houseboats may interfere with navigational tows.[120] On Kansas reservoirs, this is not a problem due to the lack of navigational traffic. However, conflicts may arise between speedboat operation and fishing. Fishermen seek quiet waters with low powered boats and are not appreciative of wave action and excessive noise caused by speedboats. This problem is resolved by the Corps of Engineers in their reservoirs. In order to insure the safety of persons using the reservoir, they may restrict certain areas for the various activities.

METHODS OF LAND USE CONTROL UTILIZED BY THE VARIOUS STATES IN RESERVOIR AREAS

Procedure for Acquiring Land Use Control Information

One of the major purposes of this paper was to survey which land use controls have appeared to be the most successful in reservoir areas. In order to facilitate this procedure, various agencies in each of the states were contacted.

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[120] Outdoor Recreation Resources Review Commission, Report 10, op. cit., p. 32.

Thirty-three agencies with state planning authority, identified in the Journal of the American Institute of Planners as of 1960, were contacted concerning this problem. Water resource agencies, commissions, boards and state engineers of the remaining seventeen states were sent inquiries of the same nature. These agencies from the seventeen remaining states which did not have state planning authority, were selected from the "State Administration of Water Resources" published by the Council of State Governments at Chicago in 1957. This publication summarized all of each state's agencies concerned with water resources. From this summary, the agency which was deemed to be most closely associated with the control of land around reservoirs was selected and sent an inquiry concerning this problem.

A total of forty replies were obtained from the various states with a large assortment of copies of state planning legislation and state sanitary codes concerning water supply and sewage disposal. In many instances these replies came from state agencies other than the ones the inquires were sent to, due to the overlapping of duties and regulations of state agencies concerning water resources and water impoundments. Appendix A contains a replica of the letter sent to the various states.

Additional information concerning land use controls around public reservoirs of the various states was obtained from Dwight F. Metzler, Executive Secretary of the Kansas Water Resources Board. In April of 1963, he had corresponded with the fifty state boards of health concerning aspects of land use controls in reservoir areas. His correspondence was made available for this study and with the supplementation of this material, replies were received from all but two of the states.

Controls Utilized by the States

These replies indicated that nearly all of the land use planning, zoning and regulation of subdivisions on private reservoir shorelands it accomplished through the effort of local planning commissions and governing bodies if the impoundment is in the local governing bodies' jurisdiction. However, little control has been exercised by local bodies. This is due, in part, to the lack of initiative of local governing bodies to adopt enforcement powers (zoning, subdivision regulations) especially at the county level of government. It is also due to the fact that approximately one-fourth of the states do not authorize zoning powers to their counties, and counties in three-fourths of the states do not have the power of subdivision control.[121] All states provide zoning enabling legislation for cities and nearly all of the states provide subdivision control enabling legislation for cities.

The following is a summary of replies received from a number of the states concerning land use controls in reservoir areas. In these states, some attempts have been undertaken to control land contiguous to reservoir areas by various methods.

Arkansas. The Game and Fish Commission has constructed a number of fishing lakes; the Commission controls the water and a narrow strip of acquired land completely around the waters' edge. This is done to assure public access to the entire lake and to control commercial boat docks. The Commission does not control any private land contiguous to the public land.

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[121] Henry F. Morse, Role of the States in Guiding Land Use in Flood Plains, Georgia Institute of Technology, Special Report No. 38, p. 27.

The State Board of Health controls recreation on water supply reservoirs by limiting the number of boat docks; this policy limits the usage of one boat to ten surface acres of the lake. The municipality utilizing the water supply reservoir is requested to zone the lake concerning boating and fishing uses. Skiing and swimming are prohibited as well as overnight facilities on boats. On Corps of Engineer lakes which serve as water supply reservoirs, docking permits are required from the State Board of Health previous to the issuance of a permit by the Corps. The city which is authorized to form the water district must own a 300-foot strip of land around the reservoir one-half mile above and below the intake structure.

California. The following agencies own reservoirs in California: (1) Domestic Water Utilities; (2) Irrigation Districts; (3) U. S. Bureau of Reclamation; (4) Corps of Engineers and Forest Service; and (5) the State of California. Other than federal policies controlling land use around federal reservoirs, some counties have utilized local zoning ordinances for this problem. There has been little or no control used around irrigation district reservoirs; however, they have not been utilized extensively for recreational purposes. The Department of Public Health imposes regulations on water supply reservoirs which are enforced by the state and local health departments and the water utility constructing the reservoir. The State Department of Water Resources, the agency constructing state reservoirs under development at this time, will establish land use and control policies for the reservoir area. Some of the development in these areas is and will be undertaken by the State Department of Parks and Recreation, a Divi-

sion of Beaches and Parks. The Department of Public Health has recognized the need for further control of sanitation at reservoirs. An outline of subjects which are being considered for future regulations is contained in Appendix B.

Delaware. The Hooper Reservoir serving the City of Wilmington in New Castle County is the only major water impoundment in the state. This county has established a "Regional Planning Commission" which has power to approve all plats in which roads are to be dedicated for public use. The State Board of Health has representation in this Commission and must approve water and sewerage plans.

Georgia. Section eight of the General Planning Enabling Act of 1957 (including all amendments through the regular 1963 session of the General Assembly) contains special provision for zoning shoreline areas of streams or water reservoirs. This Section provides, among other things, that a municipal planning, a county planning commission, or a municipal-county planning commission may prepare and present a zoning plan to its governing body or bodies for the entire area of a municipality, or for the entire unincorporated area of a county... or for "land or water areas 500 feet wide on either side of any water line of a stream or water reservoir or section thereof within the unincorporated area of the county."[122] The governing body or bodies can then exercise their grant of power from the state enabling statutes to adopt this zoning plan as an ordinance.

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[122] Local Planning Legislation, Georgia Department of Industry and Trade, p. 5.

As of May, 1963, there were thirteen Regional Planning Agencies either organized or under organization formed by groups of cities and counties to provide an area-wide base and framework for overall planning and development of their respective regions. These agencies are interested in developing coordinated regional planning for major highways, regional recreational facilities, regional development and promotion of tourist attractions, agricultural and industrial development, water resource development, and such other matters that can be profitably pursued at a regional level.[123] Georgia is the first state to provide legislation specifically for zoning of reservoir land use areas and one of the few states to develop regional planning.

Hawaii. In 1961, the State Legislature passed Act 187 known as the State Land Use Law. Under this Law all land in the state was classified into urban, agricultural or conservation districts. Conservation districts are governed by the State Department of Land and Natural Resources; it is within these districts that existing watersheds, forest reserves, flood plains and proposed reservoir sites are located. Public hearings in the counties are required previous to the adoption of district boundaries and any department or agency of the state or county, or any property owner or lessee may petition their respective county planning commissions for a change in the boundary of any district.[124] The power to zone can be exercised by the state, and the county planning commission is authorized as the agency to enforce the state ordinances.

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[123] Directory of Local and Regional Planning Agencies in Georgia, Georgia Department of Industry and Trade, p. 13.

[124] Act 187, Session Laws of Hawaii 1961, Rules of Practice and Procedure, Interim Regulations, Temporary District Boundaries, Hawaii Department of Planning and Research, p. 3.

The Land Use Law is still in its infancy and has not been tested; however, it appears that state wide planning and zoning in Hawaii will be an excellent tool for controlling use of lands around reservoir areas.

Indiana. The authority granted public bodies for the control of lands surrounding public reservoirs is authorized only under the general planning statutes. Cities are authorized to develop comprehensive plans and the necessary implementing ordinances within a distance of two miles from their corporate limits. These cities are also allowed to extend this jurisdiction to surround any reservoir or lake that is located partly or wholly within their area of jurisdiction. This extension of the area of jurisdiction is limited to lakes lying wholly within the state and may include all or any part of an area within 2,500 feet from the shore line. If county plan commissions comply with city provisions of the law, the city jurisdiction ceases at the corporate limits unless the county commissioners expressly authorize the city to continue jurisdiction.[125]

The Stream Pollution Control Board has established the policy that water companies, private or municipal, must control access to water supply reservoirs by acquiring a strip of land, a minimum of 10 feet wide, measured horizontally from the high water line. This Board also approves plans and specifications for water and sewage works. When water pollution or health hazards exist or are anticipated, the Board requires that adequate sanitary facilities shall be provided. The State Department of Conservation controls and operates certain areas around Corps of Engineer Reservoirs.

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[125] Community Planning Legislation, Bulletin 81 (rev.), Indiana Department of Commerce, p. 6.

Mississippi. Reservoir land use planning and control is becoming a reality in the Pearl River Reservoir area near Jackson. Seven counties have entered a planning program and adopted necessary zoning and subdivision controls. The Pearl Reservoir Board, the seven county planning commission, has the power to control land within its district boundaries and around the Pearl River Reservoir. However, as of May, 1963, only Madison County has enforced zoning controls, subdivision regulations and building codes which will control the development around the reservoir. This reservoir will serve as a water supply source for the City of Jackson and also be utilized for recreation purposes. The Mississippi State Board of Health is attempting to persuade the reservoir authorities, the Pearl River Valley Water Supply District, to adopt policies and regulations which will assure Jackson a satisfactory water supply. The Board has had very good cooperation with the Corps of Engineers concerning sanitation problems at their projects and hopes this may be accomplished with the authorities of the Pearl River Reservoir.

Montana. The State Parks Division and the Fish and Game Department administer some of the government owned lands around the Bureau of Reclamation Reservoirs and two reservoirs constructed by the Montana Water Board. Control of private lands around these reservoirs are regulated by county zoning laws. The State Board of Health has control of all public water supplies and disposal of sewage which may pollute the water of any spring, pond, lake or stream utilized as a source of water or ice supply. The State Board of Health is also authorized to approve subdivisions, especially concerning the water

supply and sewage disposal facilities for the subdivision. The Board has no jurisdiction concerning control of land or zoning around reservoirs.

Nebraska. The National Park Service, the Fish and Wildlife Service and the Game Commission work together in developing plans for public use areas, group camp areas, boating facilities, camping areas and seasonal cabin areas on Bureau of Reclamation Reservoirs. The National Park Service is not required to aid the Corps of Engineers in reservoir planning but may be asked to do so by the Corps. There is an annual inspection of Bureau of Reclamation projects by the managing agency and the Bureau itself to facilitate the maintenance of the project. The Harlan County Reservoir, a Corps project, is the only federally constructed reservoir in Nebraska which is not under some form of state management.

The state is developing water areas which are resulting from construction of the Interstate Highway in the Platte River Valley. The Game Commission is succeeding in persuading the county commissioners to zone around these recreation areas to prevent undesirable development along the shore lines.

The Game Commission is working with the Corps of Engineers on flood control projects on Salt Creek for the provision of recreation in the reservoir areas. The Commission is acquiring additional land for public recreation purposes. These factors were included in the original congressional authorization of the flood control projects.

Nevada. Lake Tahoe and Mead are the only two large water impoundments in the state. Lake Tahoe is a natural lake and is treated specifically with its own statute. A copy of this statute is in Appendix C.

The State Board of Health reviews and approves all subdivision plans in the Lake Tahoe Watershed before they are recorded or presented for final approval by zoning authorities.

North Carolina. The State Board of Health is authorized and directed to adopt rules and regulations governing the sanitation of watersheds from which public drinking water supplies are obtained. These rules and regulations are enforced by local health officials.

Cities and counties are generally authorized to adopt zoning ordinances and subdivision regulations; these may be applied to areas around reservoirs as well as any other area.

Community water and sewerage systems within reservoir developments must be approved by the Board of Health and the Stream Sanitation Committee. All private or individual systems must be approved by county health departments. Proposed recommendations for control of pollution for residential lots on Catawabia River Reservoir are found in Appendix D.

Ohio. The Division of Water, Ohio Department of Natural Resources, believes that acquisition of adequate land around reservoirs is the best way to control land development. The Department of Natural Resources attempts to undertake pre-construction planning in order to determine the potential uses of the reservoir site and to acquire adequate land to insure the implementation of these plans.

Oklahoma. The State Department of Health through the Reservoir Sanitation Law and other statutes has authority to protect the waters of a reservoir

within 600 feet of the shoreline and to license motels, hotels, tourist courts, etc. These regulations are applicable to private land surrounding the reservoir. A replica of the Reservoir Sanitation Law is provided in Appendix E.

Presently, during the Summer of 1963, enabling legislation is being drafted by the state to allow for planning and zoning authority around reservoirs, post facilities and turn-arounds.

Tennessee. Local planning commissions and governmental units have adequate legal authority to control land uses around shorelines. However, due to lack of local governmental action, reservoir land use planning and implementation of these plans has somewhat lagged in a state that has many reservoirs constructed by the TVA. Evidence reveals that adequate land use planning and zoning will be a reality in the Melton Hill Reservoir area near Knoxville. In 1960, the Tennessee State Planning Commission completed a comprehensive plan for land use development for the forthcoming Melton Hill Reservoir which has to be completed in 1963. The Commission recognized that the reservoir would: (1) extend navigation up the Clinch River to Clinton and provide new outlets for coal and timber resources which would boost the lagging economy of the Cumberland Plateau Counties; (2) increase the industrial potential of the region by providing additional industrial sites; and (3) increase the recreation potential in the region.[126] The Commission recommended that governmental agencies in the reservoir area should form a regional council staffed with planning personnel of the various governmental units to seek cooperative solutions to insure orderly land use development in the reservoir area.

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[126] Tennessee State Planning Commission, op. cit., p. 3.

The State Planning Commission prepared the comprehensive plan and its role was to coordinate and assist the local planning commissions in implementing this plan through acquisition of recreation lands, transportation planning, and zoning and regulations of subdivisions. The State Planning Commission recommended that the TVA should make a special effort to cooperate with the local governmental units to achieve the objectives of the comprehensive plan.

As of the early part of 1962, Anderson County, Clinton and Oak Ridge have taken definite steps toward preservation of industrial sites on the reservoir. Their actions are an outgrowth of the 1960 land use study of the Melton Hill Reservoir Area. Anderson County has adopted a zoning ordinance which provides for the establishment of industrial districts. Anderson County and the City of Clinton are sharing the costs of providing access into one of the prime industrial areas on the reservoir.[127] Boat harbors are in the process of development and areas are already designated for commercial fishing. Oak Ridge has established a port authority and will soon request land for a public terminal.[128] This action is taking place before the reservoir is constructed. The preparation of a comprehensive plan for land use development in the Melton Hill Reservoir Area and evidences of its implementation by local governing bodies may well be the most important initial pilot effort of reservoir land use planning whereby a state planning commission, the TVA and local governing bodies have cooperated in this type of venture.

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[127] Tennessee Valley Authority, op. cit., p. 7.

[128] Nature's Constant Gift, Tennessee Valley Authority, p. 62.

Virginia. State legislation authorizes regional, county and municipal planning with municipal and county zoning and control of subdivisions which possibly could be utilized for reservoir land use planning. Although the regional planning commission is not authorized to zone or regulate subdivisions, they have the power to approve the acquisition or disposition of land for public purposes and the construction of any public improvement or institution that other local governing bodies in the region are proposing which is in conflict with the regional plan.

The State Water Control Board has general jurisdiction over matters relating to pollution of state waters. The Board makes its decisions with respect to maintaining specified water quality; it has no zoning and planning authority. The Board will not issue certificates for discharge of sewage into state waters until an applicant has been certified as first satisfying local zoning and planning authorization boards. This regulation is a simple device to avoid the issuance of a number of certificates for facilities which may never be constructed because the owner could not comply with local zoning ordinances.

Wisconsin. Control of shoreline development is regulated at the local governmental level; legislation adopted at this level tends not to be sufficiently comprehensive, precise and enforced. Two bills and an amendment to one of the bills was before the 1963 state legislature for adoption concerning this problem. According to Walter K. Johnson, June 7, 1963, Deputy Director of the Department of Resource Development, the amendment appears to be the most likely form of legislation to be adopted by the legislature. This amendment

would authorize the Director of the Department of Resource Development, the present state planning agency, to prepare general standards and criteria for the planning, zoning and zoning administration of shoreline areas which are designated as district lands. These district lands are lands located within 500 feet of the normal high water mark of any navigable river and other land specifically designated by the Director.

The Director shall consult with interested citizens, representatives of the League of Wisconsin municipalities, the town boards' association and the county boards' association; he shall also consult with the state committee on water pollution, board of health, public service commission and the conservation department in the preparation of these standards and criteria.

Significant Aspects of the Replies

Nearly all of the control of private land around reservoirs has been accomplished at local levels of government; however, very few of these have taken much initiative in reservoir land use planning. See Table 6 for summary of planning and reservoir planning activities of the sixteen states. Most state public health agencies exercise some control over reservoir land use development when it concerns the protection of public health. Two state boards of health of the sixteen states are authorized to reveiw and approve subdivision development provisions previous to review and adoption by local planning and zoning authorities, One state board will not issue certificates for disposal for sewage into state waters until local planning and zoning authorities are satisfied. This procedure

Table 6. Summary of State Planning and Reservoir Planning Activities in Sixteen States.

State	Local[1] Zoning Enabling Legislation		Local[1] Subdivision Control Enabling Legislation		Reservoir Planning Activities				
	City	County	City	County	State Planning and Control Local Control	Regional Planning and Local Control	State Board of Health has Subdivision Control	Various State Agencies Control Land or Promote Land Control	Cities Extend Jurisdiction
Arkansas	x[2]		x	x				x	
California	x	x	x					x	
Delaware	x	x[2]		x		x			
Georgia	x	x	x	x		x			
Hawaii	x	x	x	x	x[3]				
Indiana	x	x	x	x					x
Mississippi	x	x	x			x			
Montana	x		x				x		
Nebraska	x	x[2]	x					x	
Nevada	x	x	x				x		
N. Carolina	x	x[2]	x					x	
Ohio	x	x	x					x	
Oklahoma	x	x[2]	x	x	x[3]				
Tennessee	x	x	x	x					
Virginia	x	x	x	x				x	
Wisconsin	x	x	x		x[3]				

1 - Information from Role of the States in Guiding Land Use in Flood Plains by Henry F. Morse, Georgia Institute of Technology, Atlanta, Special Report No. 38, 1962.

2 - Certain classes of cities and counties.

3 - As of June, 1963, only anticipated.

would necessitate cooperation between state public health agencies and local planning and zoning authorities; however, it might save time and money in processing of subdivision plans for each of the bodies.

Statutes of Indiana which authorize cities to extend their jurisdictions to surround reservoir areas would be useful because development would possibly occur more expeditiously and in greater amounts due to the nearness of a population concentration. However, cities cannot utilize this legislation unless the reservoir is within two miles of its incorporated limits.

Regional planning, combination of cities with counties, cities with cities, and counties with counties, is becoming a reality with the participating local governmental units enforcing subdivision regulations and zoning controls. Georgia has state enabling legislation with specific provisions for reservoir shoreland planning and zoning. The Pearl River Reservoir Area in Mississippi consists of seven separate counties attempting to plan and enforce controls in the reservoir areas. A regional commission in Tennessee is planning for land uses in the Melton Hill Reservoir Area with enforcement of controls from participating cities and counties. Additional technical assistance is being provided by a strong state planning agency which has prepared the land use plan for the reservoir area.

Wisconsin is considering the adoption of legislation which would provide the Director of the Department of Resources Development with consultation with other state agencies to prepare standards for the planning, zoning and zoning administration of shoreline areas within 500 feet of the high water line or

other land specified by the Director. If there is no local planning and zoning administration in the shoreline areas or it is substandard to state criteria, the state will provide services and advice of professional personnel at no cost to alleviate this problem. Oklahoma is also presently considering the adoption of specific legislation for reservoir land use planning.

The State of Hawaii, has adopted a state land use plan with state zoning authority which appears to be a promising tool for the control of land around reservoirs, but is yet untested.

There is a trend for state park, resource, and fish and game commissions to cooperate with federal authorities in pre-construction planning of federal impoundment areas. If the states do more pre-planning with federal agencies for recreation areas on reservoir sites, more consideration could be given to the acquisition of land for public access or other purposes. Perhaps the federal government would acquire additional lands for access purposes if the state had previously accomplished planning for anticipated recreational needs. With this pre-planning, the state itself would be alerted to the needs of access and recreation could acquire additional land contiguous to federal land for these needs. The policy of federal agencies has been to release some of the federally acquired reservoir shoreland to the states for administration.

In conclusion, there has been initial considerations for reservoir land use planning and control in some of the states. It appears that there will be more state leadership in this area with state planning, park, health, game and water resource agencies participating in control of land uses contiguous to federal reservoirs.

The Kansas Situation

There is no state legislation in Kansas which specifically authorizes reservoir land use planning and control. However, this activity could be undertaken or partially undertaken through utilization of existing statutes which authorize city, county and metropolitan or regional planning. A discussion of these statutes will be undertaken in the last chapter. To date, there has been little land use planning and control in reservoir areas undertaken by local planning commissions and governing bodies.

There are a number of state agencies which have been and are involved with development of federal reservoirs and varying amounts of control of land adjacent to these impoundments.

State Geological Survey. The Survey maintains informal relationships with the Corps of Engineers and other public agencies relative to federal reservoirs. Consultation is undertaken with the geologists and engineers of the Corps of Engineers concerning stratigraphy.

The Geological Survey also advises engineers of the Division of Water Resources, State Board of Agriculture, in connection with the planning and construction of dams and reservoirs undertaken by municipalities, rural water districts, and private enterprise.[129]

Forestry, Fish and Game Commission. The role of the Forestry, Fish and Game Commission in planning the operation of a reservoir is directed primarily to the preservation, conservation and development of fish and wildlife resources within the area affected by the reservoir.

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[129] J. M. Jewett, letter to author, October 23, 1963.

The role of the Commission begins with the early stages of reservoir planning. Through study, coordination and planning with the various agencies involved, a recommendation is made to the construction agency jointly by the U.S. Fish and Wildlife Service and the Kansas Forestry, Fish and Game Commission. This recommendation indicates the damages and losses that might be expected to result from the development of the project. Additional recommendations are offered to offset these damages and losses, either by replacement work or by alteration of the plan of the construction agency. In some instances recommendations are also included which would, if applied, result in improving the project area for the benefit of fish and wildlife. All of the recommendations are submitted in a report to the reservoir construction agency who may implement or reject them. This report will also make specific reference to recommendations for the use of certain areas of reservoir shore land after the reservoir is completed. These provide that those lands suited for fish and wildlife management should be made available to the Forestry, Fish and Game Commission for management as a wildlife management area. Such areas are primarily designed for use as public hunting areas which are available to the public without charge. In the instance where the construction agency or the Kansas State Park and Resources Authority operates general recreation areas on reservoir shore land, considerable coordination between the various agencies must take place. The Forestry, Fish and Game Commission shares its land management authority with these other agencies.[130]

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[130] Richard B. Eggen, letter to author, November 5, 1961.

Kansas Park and Resources Authority. This Authority was created by the State Legislature in 1955 to formulate a state Recreation Plan and to develop public recreation facilities. It is authorized to acquire, lease and improve property for park purposes. It may also acquire possession of any existing state lake or park owned by the Forestry, Fish, and Game Commission or any other state agency although it has not done so as of July, 1963. The acquisition of future park lands through land condemnation, purchase or lease can be undertaken only by legislature approval.

The program of the Authority, to date, has consisted of development of state parks at five of the existing federal reservoirs in Kansas. Development of a sixth park is being undertaken presently (1963) at Pomona Reservoir which is still in the construction stage. The land for these parks has been leased to the Authority by the Corps of Engineers or the Bureau of Reclamation. The Authority develops the facilities at these parks which include bath houses, beaches, picnic areas, camp grounds, scenic trails, roads and parking areas, boat ramps, toilets and shelters.[131]

Funds for capital improvements and other expenditures of the Authority in the past have been obtained from the state general fund appropriations. Although the Authority is authorized to issue revenue bonds for acquisition, improvement or construction of park property, it has not done so as of this date. A small amount of revenue has been collected in the form of fees, tolls, rentals and other charges for concessions, camping and checking clothing at

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[131] Lynn Burris, Jr., letter to author, October 23, 1963.

swimming beaches. As a means of providing more user-financing of park facilities, an annual park and recreation motor vehicle permit costing five dollars will be required beginning January 1, 1964 for those who utilize lands under State Park and Resources Authority.[132]

The Kansas State Department of Health. This department has no statutory authority for supervising or controlling the planning and subdivision of land in the state. Its role has been one of advising and counseling local city and county officials who are authorized to utilize planning and zoning power. The Department of Health also advises state and federal agencies who are concerned with the development and management of recreational areas around reservoirs.

According to Mr. Ivan Schull, Chief of General Sanitation, State Department of Health, it must be emphasized that all activities of the Department of Health in the recreational development of reservoir shoreline areas are advisory and as such are often inadequate to insure proper solutions for the sanitation problem.

He stated that federal and state agencies have been most cooperative in areas under their jurisdiction. However, local, county and city officials have tended to delay essential planning until it is too late or they attempt to establish complicated zoning programs without previous basic planning.

Kansas Water Resources Board. This Board was created in 1955 to serve as a state water planning and study organization. The principal statutory

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[132] Kansas State Park and Resources Authority, Kansas Recreation, Past, Present, Future, Unpublished Draft Report, July 1, 1963.

duties of the Board are summarized as follows:

> 1. Work out a state plan of water resources development for each watershed in the state.
>
> 2. Collect and compile information pertaining to climate, water and soil as related to the availability and usage of water.
>
> 3. Study the Laws of Kansas, other states, and the federal government relating to the conservation and development of water resources for the purposes of determining the need for new or amendatory legislation in this state.
>
> 4. Make recommendations to the Governor and legislature concerning necessary or advisable legislation pertaining to any of the matters it is required to study, and to other state agencies and political subdivisions of the state in the matter of coordination of water activities.[133]

The Board consults with federal agencies on many occasions and participates in the review or study of water project plans at all levels of development. The Board has interest in the development of water supply features of federal reservoirs and considers recreational needs in preparing comprehensive state plans for water resource development.

The Water Resources Board has no direct control of development of land contiguous to federal reservoirs. However, the Board will be giving consideration to this problem in the near future.[134]

Kansas Economic Development Commission. The forerunner of the Kansas Economic Development Commission, the Kansas Industrial Development Commission, has acted as an administrative, promotional, advisory and coordination agency in matters pertaining to community planning. The KIDC was

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[133] Kansas Water Resources Board, Bienniel Report, June 30, 1962.

[134] Dwight Metzler, letter to author, October 29, 1963.

the agency which administered the 701 planning program for local communities in the state. If federal funds would have been obtained for reservoir land use planning, the federal monies would have been channeled through the KIDC. The KIDC was also a promotional agency for tourism in Kansas, and recreational attractions.

The powers of the KEDC are spelled out in broader terms than the earlier powers of the KIDC by Senate Bill No. 156 passed by the 1963 State Legislature. Portions of the Bill which might pertain to the development of reservoir areas are excerpted and follow below:

> (a) To assume central responsibility and co-ordinate within the department all facets of a comprehensive economic development program.
>
> (b) To create and carry out a co-ordinated plan with all other state departments and agencies which do research work, develop materials and programs, gather statistics, or which perform functions related to economic development...
>
> (c) To advise and co-operate with all federal departments, research institutions, educational institutions and agencies, quasi-public professional societies, private business and agricultural organizations and associations, and any other party...
>
> (f) To create and carry out, or cause to be created and carried out, a co-ordinated program of scientific and industrial research with the objective of developing additional uses of the state's natural resources, agriculture, agricultural products, new and better industrial products and processes, and the best possible utilization of the raw materials in the state...
>
> (j) To encourage and promote the traveling public to visit this state by publicizing information as to the recreational, historic and natural advantages of the state and its facilities for transient travel; and the department may request other state agencies such as, but not limited to, the water resources board, the state park authority, the forestry, fish and game commission and the state highway commission for assistance and all such agencies shall co-ordinate information and their respective efforts with the department to most efficiently and economically carry out the purpose and intent of this subsection.

(k) To serve as the central agency and clearing house to collect and disseminate ideas and information bearing on local planning problems; and, in so doing, the department may, upon request of the board of county commissioners of any county or the governing body of any city in the state, make a study and report upon any planning problem of such county or city submitted to it.

(l) To represent the state in assistance programs of the federal government to political subdivisions, such as planning assistance under section 701 of the federal housing act, and other similar programs.

(m) To assist counties and cities in industrial development through the establishment of industrial development corporations...

(n) To render assistance to private enterprise on planning problems and site surveys upon request...

(o) To make agreements with other states and with the United States government, or its agencies, and to accept funds from the federal government, or its agencies, or any other source for research studies, investigation, planning and other purposes...[135]

State Highway Commission. The State Highway Commission has the power to establish, designate, open, relocate, alter, vacate, remove and re-establish highways in every county in the state. The Commission may also use state highway funds for the purchase of right-of-way, construction of new highways, improvement, reconstruction and maintenance of highways over the most direct and practicable routes from state highways to a state lake or a federal lake or reservoir established by Federal Authority.[136]

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[135] Laws of the State of Kansas, 1963, (Senate Bill No. 156), 407:970-972.

[136] Supplement to General Statutes of Kansas, Annotated, Chapter 68, Art. 4, p. 906.

House Bill 112, passed by the 1963 Kansas State Legislature, authorizes the State Highway Commission to acquire by purchase or the power of eminent domain, real property or property rights for the future construction, reconstruction, improvement, maintenance or drainage of routes on the state highway system or for use as roadside parks, rest areas or park facilities along or conveniently near state highways.[137]

1. State Geological Survey:	Consultant to Federal Agency Geologists and Engineers.
2. Forestry, Fish and Game Commission:	"Develops, operates and maintains recreational resources in interests of public hunting and fishing and wildlife preservation and propagation."
3. Park and Resources Authority:	"Develops, operates, and maintains state parks at federal reservoirs."
4. Department of Health:	"Technical assistance and guidance in matters of sanitation and safety" (advisory)[138]
5. Water Resources Board:	Considers recreational needs in preparing comprehensive state plans for water resource development.
6. Kansas Economic Development Commission:	administers 701 funds which could be utilized for reservoir land use planning, informational agency concerning local planning problems, and promotes the state's recreational potential.
7. State Highway Commission:	Constructs access roads to reservoirs and develops and maintains roadside parks.

A summary of methods of land control contiguous to federal reservoirs in Kansas, indicates a situation which is similar in many other states. The public

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[137] Laws of the State of Kansas, 1963 (House Bill 112), 333:816.

[138] Kansas State Park and Resources Authority, op. cit., p.7.

land in fee and easements contiguous to shorelines is controlled by federal or state agencies. Control of private land is left up to local governmental agencies which has generally been inadequate for proper development of reservoir areas.

SUGGESTED SOLUTIONS FOR RESERVOIR LAND USE PLANNING AND CONTROL IN KANSAS

The Delineation of the Reservoir Planning Area

The reservoir planning area could possibly be as large as the watershed area of a respective river. A watershed is a hydrological unit in space composed of an inter-related drainage area with a common movement of water including all consequential implications for land and water use.[139] In other words, it is a natural drainage area tied together physically by an inter-related stream and drainage pattern.

In total water resource planning, the watershed is the logical natural planning area. However, for controlling private land around federal reservoirs, this unit is possibly too large. The area of concern in control of land around reservoirs would be a few hundred feet to a few miles depending on the demand for shore line usage. If the lake is near a metropolitan area, there may be a greater demand for permanent residential home sites and recreational access to the lake. The shoreline of a lake isolated from population masses would be utilized to a lesser degree.

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[139] Southeast Land Tenure Research Committee, Economics of Watershed Planning, p. 6.

The replies of the various states indicated control areas of 500 feet to 2,500 feet. Mr. Ivan Schuil of the Division of Sanitation, Kansas State Board of Health, believes that this distance should be one mile.

From all indications of development at Tuttle Creek Reservoir, a 500 or even a 2,500 foot control zone would be inadequate. Residential platting has taken place over one mile east of the reservoir high water easement line.

If a control area is designated from the shore line in distance, it should be measured from the conservation pool elevation. If the area was measured from the high water line at Tuttle Creek Reservoir, the control area would merely control development a number of miles along a river most of the time. If a control area was measured from the conservation pool at Tuttle Creek Reservoir, it would extend into Marshall County near the confluence of the Big Blue and Black Vermillion Rivers.

From indications at Tuttle Creek Reservoir and the near proximity of Cheney Reservoir to the large metropolitan area of Wichita, a two-mile zone measured from conservation pools would not be an excessive area of control. At other federal reservoirs in more rurally-oriented areas, this control area would not need to be nearly as extensive; the control area could possibly be only one-half mile from the conservation pool. To avoid confusion and possible differing interpretations concerning the control area, it is suggested that this area should be measured horizontally, not less than one mile from the conservation pool.

Existing Planning Statutes

The power to carry on land use planning and control is authorized by enabling statutes of the State of Kansas to local governmental units. Political boundaries are formed by these local governmental entities and these entities may govern the area within their boundaries as authorized by state statutes.

A political boundary is one of the most dominent influences in the creation of a planning and control enforcement area. The reservoir planning areas indicated by the replies of the various states included whole counties in which any portion of the reservoir was located in order to facilitate enforcement of subdivision regulations and zoning powers. It would appear to be essential to include the entire area of local political units (municipalities and counties) within the same planning region for obvious reasons of workability.

The present Kansas Statutes relating to planning powers and jurisdictions could be utilized for reservoir land use planning, although there is no specific legislative reference to this type of planning. Sections 12-716:721 of the 1961 Supplement to the General Statutes provide

> that any two or more cities or counties or political subdivisions having joint planning jurisdictions or any county and cities within or adjacent to the county may cooperate and provide for a joint metropolitan area or regional planning commission.[140]

A planning commission such as this may carry out any planning function which the joining units may separately exercise and perform. This type of

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[140] Planning Tools -- Theory, Law and Practice, League of Kansas Municipalities, p. 6.

commission is authorized to do master planning and the participating planning units may request this commission to assume duties and functions of the local units in whole or in part.[141] Only at the request of a participating unit can this type of commission administer zoning or subdivision regulations; it is not granted direct zoning or subdivision regulation authority.

It appears that a reservoir planning commission with participating local commissions (municipalities and counties) could be formed utilizing this statute to accomplish reservoir land use planning, and with request of the local units could administer zoning and subdivision regulations.

If a reservoir is located entirely within a certain township or county, Sections 19-2901:2913 and 19-2914:2926 respectively, of the General Statutes of 1949, as amended, could be utilized for reservoir planning, zoning and subdivision control. Cities of Kansas, are authorized these same powers in Sections 12-701 and 12-702 of the General Statutes of 1949. Cities are authorized zoning and subdivision authority in Sections 12-708 of the 1961 Supplement when they have not established an authorized planning commission. In this instance, a city may authorize a committee or a special commission to exercise these powers.

Although there is no special legislation authorizing reservoir shore line control of private land or the existence of a state planning agency which could provide technical and coordinating assistance to local bodies, it appears that this type of control could feasibly be accomplished with existing statutes.

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[141] Ibid., p. 18, 19.

It is feasible, but improbable, that local governmental units would designate areas of control and undertake land use planning and control in reservoir areas due to their lack of initiative and knowledge concerning the bad effects of uncontrolled development. To aid governing bodies in control of land around reservoirs, existing enabling statutes should be amended or new statutes should be drafted specifically for this important matter. Should the control be exercised by counties, cities, townships, regions or the state? It is apparent that cities and townships would not be the most suitable body to be specifically designated to control land contiguous to reservoirs due to the limited size of their political boundaries.

Control by Counties

Control by counties could be effected in two different ways. Each county could become the planning unit individually, or individual counties could establish a regional planning commission with participation by each county.

The first approach might be utilized if the reservoir is located entirely within the boundaries of a single county. Control by single counties would be a feasible solution if all major impoundments were located within single counties. However, out of the 23 federal reservoirs which are existing, under construction, or probably to be constructed in Kansas, by 1975, approximately one-third of them are, or would be, located within the jurisdiction of two or more counties.

In the instance where a reservoir is located in two or more counties, the individual counties in which the reservoir lies could be given the authority to establish a regional planning commission. This commission would serve as an advisory group to the elected officials of the respective counties. The commission would have the authority to prepare a regional plan for the designated planning and control area. The responsibility for the enactment and the enforcement of land use controls to implement the comprehensive plan would remain at the pleasure of the elected county officials.

There would be no assurance that all of the counties would accept participation in a program such as this. There would also be difficulty in coordinating the participation of the individual counties. This can be evidenced by observing the difficulties in getting the adoption of zoning regulations to effectuate the land use plan of Old Hickory Reservoir in Tennessee, and zoning controls at the Pearl River Reservoir in Mississippi. According to the Tennessee State Planning Commission in 1958, one of the greater tasks in planning for Old Hickory Reservoir was getting the zoning plan adopted by the respective county legislative bodies.[142] Three counties were involved in the reservoir land use plan: one county had adopted a zoning ordinance and subdivision regulations; another had adopted subdivision regulations only; and the third had adopted neither. The lack of regulatory measures or the failure to enforce regulations would tend to weaken the adopted and enforced regulations of an adjoining county.

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[142] Tennessee State Planning Commission, "The Tennessee Planner", April-June, 1958, p. 12.

Uncontrolled development in one county would further discourage the control efforts of an adjoining county.

The zoning regulations adopted by the various participating counties in a reservoir area would have to be uniformly drafted and enforced. The uniform enactment and enforcement of zoning regulations would be influenced by county attitudes and politics. Local apathy and political pressures would strongly influence the adoption or lack of adoption of zoning regulations. The regulations would, of necessity, be acceptable to conservative county courts and easily administered.

Although it is apparent that problems could arise in the enactment and enforcement of land use controls at the county level, this type of control would possibly blend into the present state administrative and legislative system more easily. None of the state departments would have to undertake reservoir land use planning and control. It appears that present state statutes concerning planning could be utilized if counties desired to do so. However, the statutes should be amended to specifically permit land use planning and zoning around federal reservoirs.

Land Use Planning and Control for Reservoirs Lying Within Single Counties

State Statute 19-2914 through 19-2926 should be amended to permit counties to adequately accomplish reservoir land use planning and control. The existing portion of the statute is not underlined (not all of the existing

statute is quoted due to the length of it). The underlined portions are the amended portions.

19-2914. County plan in counties between 10,000 and 250,000 and counties with federal reservoirs of 1,500 surface acres of water or more. For the purpose of promoting the public health, safety, morals, comfort, and general welfare, conserving and protecting property and building values throughout any county under the terms of this act, and lessening or avoiding congestion in the public streets or highways, the county commissioners of all counties in this state having a population of more than ten thousand (10,000) inhabitants and less than two hundred fifty thousand (250,000) inhabitants and counties with federal reservoirs of 1,500 surface acres of water at conservation pool, including the land bounded by not less than a one-mile ring from conservation pool from such reservoirs, herein called the reservoir planning area, lying within the corporate limits of said counties, may provide for the preparation, adoption, amendment, extension and carrying out of a county plan in accordance with the provisions of this act.

19-2915. Planning board; qualifications; terms; vacancies; political affiliations. The county commissioners may appoint a planning board for such county, which board shall consist of five members who shall be taxpayers and residents of such county, three of whom live outside the corporate limits of any incorporated city in said county, or outside the limits of said reservoir planning area, and the county engineer shall be an ex officio member of the planning board.

19-2916. Same; meetings; records; officers; quorum; rules; oaths and witnesses; employees, consultants and expenses; budget limitation. The members of the planning board or reservoir planning board shall meet at such time and place as they may fix by resolution, and all records of said meetings and proceedings shall be kept in the office of the county clerk and shall be open to public inspection.

19-2916a. Same; master plan for county; master plan for reservoir planning area; notice and hearing; adoption resolution. The planning board shall make, adopt and may publish an official master plan of the county and if there is the presence of a federal reservoir as defined in 19-2914, the reservoir planning board shall make, adopt and publish an official plan of the reservoir planning area within one year from the final conservation pool impoundment for the purpose of bringing about coordinated physical development in accordance with the present and future needs. The master plan shall be developed so as to conserve the natural resources of the county or reservoir planning area to insure efficient expenditure of public funds and to promote the health, safety, convenience, prosperity and general welfare of the inhabitants.

19-2919. Recommendations to county commissioners; effect of existing regulations. The planning board shall make recommendations to the county commissioners to determine, restrict and regulate the height, number of stories, and size of buildings, the percentage of lots that may be occupied, the size of yards, courts and other open spaces, structures and land for industry, business, trade, residence and other uses and including the distance of any

buildings from the road or street; to regulate and restrict the intensity of such uses and occupation throughout the entire unincorporated area of the county or throughout the reservoir planning area, or throughout the unincorporated area of any township containing or adjoining a city now having or which may hereafter adopt a zoning ordinance, or throughout the unincorporated area within three miles of any city now having or which may hereafter adopt a zoning ordinance: to prohibit uses, buildings, or structures incompatible with the character of such district, respectively, and to prevent additions to and alterations or remodeling of existing buildings or structures in such way as to avoid or evade the restrictions and limitations lawfully imposed herein.

19-2919a. Date of adoption of regulations for reservoir area. The county commissioners shall adopt zoning regulations within fifteen months of final conservation pool impoundment.

Land Use Planning and Controls for Reservoirs Lying in Two Counties or More

Statutes 12-716:721 of the 1961 Supplement to the general statutes which authorizes regional or joint metropolitan area planning should be amended as follows to permit reservoir land use planning and control in federal reservoir areas.

12-716. Area planning by certain political subdivisions; joint commission, powers. Any two or more cities or counties or other political subdivision having adjoining planning jurisdictions, or any county and city or cities within

or adjacent to the county, may jointly cooperate in the exercise and performance of planning powers, duties and functions as provided by state law for cities and counties. Any two or more counties with federal reservoirs of 1,500 surface acres of water or more at conservation pools including the land bounded by not less than a one-mile ring from the conservation pool from such reservoirs called the reservoir planning area, may jointly cooperate in the exercise and performance of planning powers, duties and functions as provided by state law for cities and counties.

When two or more of such cities and counties shall by ordinance, resolution, rule or order, adopt such joint planning cooperation, there shall be established a joint planning commission for the metropolitan area, reservoir planning area, or region comprising the area coterminous with the areas of planning jurisdiction of the cities or counties cooperating jointly. Such a joint planning agency for the metropolitan area or region may be empowered to carry into effect such provisions of state law relating to planning which are authorized for such joining cities or counties and which each may under existing laws separately exercise and perform. Any other public authority or agency which operates within, wholly or in part, the area covered by this joint planning cooperation may likewise join with the cooperating cities or counties in cooperative planning through resolution of its governing board or commission.

12-717. Same; purpose of metropolitan or regional commission; plans and recommendations. The plans and its recommendations may in whole or in part be adopted by the governing bodies of the cooperating cities and counties

as the general plans for such cities and counties. The plans and recommendations of the reservoir planning commission may be adopted in whole by the governing bodies of the cooperating cities and counties.

Technical Assistance and Control from the State Level

It is apparent that reservoir land use planning and control is slow to materialize if left to local governmental units. From experiences concerning this type of control in Tennessee, a state which has a large number of federal reservoirs and probably has progressed further in reservoir land control than any other state. It is also apparent that the fragmentary approach of the combined efforts of counties lacks a singleness of approach in reservoir land use planning and control. It appears that a single administrative unit is required to more successfully initiate and implement a reservoir land use and control program. Therefore, the state, through one of its agencies with the cooperation of other state agencies, should be authorized to initiate and see that planning and controls are implemented. New enabling legislation should be adopted to facilitate reservoir land use planning and control.

The problem immediately posed is which state agency should administer this program. A number of the states presently maintain state planning agencies with varying degrees of planning duties and powers. Kansas, presently, does not have a state planning division or department which undertakes regional, county, or municipal planning.

The states which maintain planning agencies and staffs have recognized the objectives which might be gained from this type of activity, some of which are:

(1) A resource appraisal of the state

(2) A development program for all areas within the state

(3) Improvement of metropolitan problems

(4) An attempt to relate physical to fiscal planning

(5) Assist local communities in planning.

The Kansas Economic Development Commission acts as an administrative promotional, advisory and coordination agency in matters pertaining to community planning. It is the state agency which administers the 701 planning program for local communities in the state. However, it does not undertake the research or physical planning for local entities. It reviews the research and planning which consultants provide for local governments and administers the federal 701 grant payments. The KEDC also is a promotional agency for Kansas tourists and recreational attractions. It assists counties and cities in industrial development programs and serves as the central agency for collecting and disseminating information concerning local planning problems. It is possible, since this agency is a coordinating agency familiar with land use planning and zoning, that it would be the best agency to provide technical assistance and administration of reservoir land use planning and control. More research is required at this point to determine whether the KEDC, the State Park and Resources Authority, or another of present state agencies would be the best agency for administration of this program. The newly formed office of Economic Analysis could possibly undertake this type of activity in the future. The agency most qualified to provide technical assistance in reservoir land

use planning and implementation would be a well-staffed state planning agency. One of the immediate necessities of the State of Kansas is to establish a state planning agency. Further research may indicate that the duties of the Kansas Economic Development Commission should be expanded to provide state planning services. The enabling legislation to follow is drafted with the assumption that the KEDC should administer and provide technical assistance for reservoir land use planning and control. An increase in the numbers of professional staff and the budget will have to be provided for the KEDC in their participation and implementation of this program.

An Enabling Statute Authorizing Land Use Planning and Control in Federal Reservoir Areas

This is a proposed draft of new legislation authorizing land use planning and control in federal reservoir areas. Prior to any adoption procedures, it should be reviewed by an attorney.

Section 12-721(a). Reservoir land use planning. All lands located not less than one mile of the conservation pool of any federal reservoir, of 1,500 surface acres or over, herein called the reservoir planning area, are subject to the provisions of this section.

12-721(b). Same; purpose of reservoir land use planning. The purpose of reservoir land use planning is to promote the public health, safety, convenience, and general welfare. It is in the public interest to regulate the use of lands contiguous or lying close to federal reservoir areas to the ends that water pollution may be controlled; land uses are compatible with one another;

subdivision development is promoted which provides adequate space for lot sizes; adequate circulation and public facilities are provided; adequate water and sewer facilities are provided; and natural beauty preserved.

12-721(c). Same; Land use planning and zoning. After consultation with interested citizens and others residing in the reservoir planning area, the State Geological Survey, the Forestry, Fish and Game Commission, the State Park and Resources Authority, the State Department of Health, the State Water Resources Board, and the State Highway Commission, the Director of the Kansas Economic Development Commission or his designee, hereafter referred to as the Director, shall prepare general standards and criteria for the planning, zoning, and zoning administration of land in the reservoir planning area. Such standards and criteria shall give particular attention to land use, transportation and public facilities planning and the implementation of these plans through utilization of zoning and subdivision regulations. The Director shall certify the reservoir planning area "protected by local action" and the planning and zoning shall be administered by local entity(ies) if the planning and zoning of the local entity(ies) meets the requirements of the standards and criteria prepared by the Director. When local planning zoning or its administration is non-existant or fails to meet the requirements and standards of the Director, the Director shall notify the local entity(ies) by written certified notice to the local clerk(s). The notice shall indicate what actions are required to meet said standards and criteria and shall offer to the local entity(ies) involved the services and advice of professional personnel of the Kansas Economic Development Commission at a no-cost basis. If within 150 days after receipt of such

notice or within such additional period as the Director may grant, the requirements of the notice, or other requirements acceptable to the Director, are met, the reservoir planning area shall be certified as "protected by local action" and the planning and zoning shall be administered by local entity(ies). If, after the expiration of 150 days or such additional period granted by the Director, the Director, after full consultation with local officials, may establish a plan for the reservoir planning area and issue a regulation to implement said plan with land use zoning which shall be integrated with any existing local planning and zoning as feasibly possible. Before such zoning regulation shall become effective, it shall be subject to a public hearing. The notice of the time and place shall be published twice in at least one newspaper having general circulation in the counties of the reservoir planning area, which hearing shall be held not less than fifteen days after the last publication. After such hearing, the Director may recall the regulation, amend, order it into effect, or order it into effect in its original form. Procedures for the amendment of the zoning regulation shall be the same as those specified above for the original issuing of a regulation and the ordering of it into effect. Where zoning of a reservoir land use area has been accomplished, of necessity, by the Director, he shall attempt to encourage the local entity(ies) involved to substitute appropriate local zoning and zoning administration. When such local zoning and administration is established, meeting the Director's standards, the Director shall repeal the original regulation, which initially implemented the plan for the reservoir planning area, and certify that the reservoir land use area is "protected by local action" and the zoning shall thereafter be administered by the local entity(ies).

12-721(d). Same; Subdivision regulations. Regulation of the subdivision of land in reservoir planning areas is authorized for the following purposes, among others:

(1) To encourage economically sound development

(2) To assure the provision of required streets, utilities, and other facilities for new land development

(3) To assure adequate provision of safe and convenient traffic access both vehicular and pedestrian

(4) To assure the provision of needed public open spaces and building sites through the dedication or reservation of land for recreational, educational and other public purposes; and

(5) To assure, in general, the wise development of new areas in harmony with the master plan of the reservoir planning area. The formulation and implementation of subdivision regulations shall be carried out as provided in Section 12-721(c).

12-721(e). Building permits. When land in a reservoir planning area is zoned by the regulation of the Director and building permits are required or pleas for permits of zoning change are requested, application for such permit must be submitted to the Director for review and action. If the proposed structure or use conforms to the zoning regulations, the Director shall issue the permit. If it does not, he shall deny the permit. The reasonableness of this issuance may be tested in accordance with Section 19-2926 of the General Statutes if any party is aggrieved thereof.

12-721(f). Nonconforming uses and regulations inapplicable to agricultural land. Regulations adopted under authority of this act shall not apply to existing structures nor to the existing use of any buildings but shall apply to any alteration of a building to provide for its use for a purpose or in a manner different from the use to which it was put before the alteration: Provided, That this act shall not prevent the restoration of a building damaged not more than fifty percent of its assessed valuation by fire, explosion, act of God, or the public enemy, or prevent the continuance of the use of such building or part thereof as such use existed at the time of such damage, or prevent a change of such existing use except under limitations provided herein in relation to existing building and premises. No determination nor rule nor regulation shall be held to apply to the use of land for agricultural purposes, nor for the erection or maintenance of buildings thereon for such purposes so long as such land and buildings erected thereon are used for agricultural purposes and not otherwise: Provided, That no plat nor dedication of any such land for public purposes may be made without submission to the zoning board and the approval of the county commissioners if under protection by local action or submission to the approval of Director if under regulation of the Director.

Nonconforming use rights in reservoir land use areas zoned by the regulation of the Director shall date from the time the regulation or amendment is issued. Nonconforming use rights in reservoir land use areas where local zoning and administration have, pursuant to 12-721(c), been substituted for the Director's rule, shall likewise date from the time of the Director's rule or its amendment.

12-721(g). Penalties for violations; actions. Any violation of any provision of this act shall come under the provisions of 19:2925.

12-721(h). Reasonableness; action to determine G. S. 1935, 12-705 inapplicable. Any person aggrieved by the provisions of 12-721(a):12-721(i) may have judicial review thereof under Section 19-2926.

12-721(i). Same; Invalidity of part. If any provision of this act or the application thereof to any person or circumstance is held invalid, such invalidity shall not affect other provisions or application of the act which can be given effect without the invalid provision or application, and to this and the provisions of this act are declared to be severable.

It must be emphasized that this draft is set forth as a guide to new legislation. An attorney should carefully criticize these amendments previous to utilization in any manner.

CONCLUSION

The previous amendments to existing legislation and the draft of new legislation in this thesis are recommended as guides for promoting comprehensive planning for development in each of the federal reservoir areas. Land use planning and control in Kansas reservoir areas are non-existent or piecemeal and do not completely solve the problems associated with development of land contiguous to reservoirs. The recommended solution to this problem is the preparation of a comprehensive or general plan for development of the shore line and surrounding area. This plan should be carefully prepared by the Kansas Economic Development Commission or another qualified state agency. However,

the state agency should encourage local entities to plan and implement their own plans for reservoir areas within their jurisdictions. These plans should be carefully prepared consisting of land use, transportation and public facility elements; they should be implemented by zoning and subdivision regulations. In addition, the plan should be properly integrated with the water uses of the lake, and estimates of demands for various types of land uses should be carefully developed. Special attention should be given to water, sewage and refuse services due to the soil and rock formations in Kansas reservoir areas. There is a lack of good fresh water aquifers, and soils are generally tight clay underlain with various rock formations which cause major water supply and sewage disposal problems.

Since residential development in reservoir areas resembles that of a subdivision in a municipality, the "Community Unit" or "planned development" concept could be incorporated in the zoning ordinance to facilitate the integration of land use, transportation networks and public facilities. The adequate provision of public facilities are especially important in areas distant from existing city facilities. The "Community Unit" concept is the application of community planning to large scale subdivisions.[143] Under provisions of this concept, an owner or group of owners may propose a complete "development plan" which may be adopted by the legislative body as the zoning plan for the entire area in lieu of prevailing zoning upon approval by the Planning Commission. This feature provides a flexibility in the planning of subdivisions because it permits

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[143] Arthur B. Gallion and Simon Eisner, The Urban Pattern, p. 243.

planning for a diversification of dwelling types which is usually lacking in conventional zoning. In conventional single-family residential zoning, the single-family unit is the only type residential unit permitted in the zone. The "planned development" type of subdivision expansion could permit a release from the sometimes sterile single-family isolated house and lot development type concept. As an example, multi-family units might be dispersed within areas of single-family units with space relationships being closely observed. This does not mean to say that land uses should be indiscriminately mixed. The locational relationship between various land uses would be carefully evaluated in the planning process.

The relocation of an existing small city in a proposed reservoir area would also present a unique problem. In this instance, water is going to inundate the townsite when the lake is a conservation pool. With previous comprehensive planning for the reservoir area, a new site could be selected for the town which would blend in with the development plan of the reservoir area as well as aid the townspeople in planning their new municipality.

If the small city to be relocated is in a prime development area of the reservoir, planning for public facilities of this municipality should be undertaken with the consideration that later growth will occur around this lake in the proximity of the municipality. It is not within the scope of this paper to study town relocation; however, if town relocation is necessary in a proposed reservoir area, it is a very important element which must be considered in the reservoir comprehensive plan.

Vernon Deines, Assistant Professor of Planning at Kansas State University, presented the problems and proposed solutions for town relocation in reservoir areas in a thesis in 1962, entitled An Investigation of Town Relocation as a Part of Flood Control Planning. It would be important for towns facing this problem to review Mr. Deines' study in detail.

This present study under consideration was an attempt to reveal the need for reservoir land use planning and control in Kansas, to observe the efforts of other states in this activity and to propose some guidelines for adequately attaining reservoir land use planning and control in Kansas. In summary, some of the more important findings of this study are:

(1) Precedents have been established for reservoir land use planning and control; state and federal courts have upheld the implementation of ordinances which have been legislated to protect the general welfare of the public.

(2) Earlier justification for the construction of federal reservoirs was flood control, improvement of navigation and provision of irrigation waters. Project justification is becoming more multi-purpose; recreation is now becoming a major project purpose along with other purposes such as water supply storage and others. In short, the general public is enabled to utilize federal reservoirs and their facilities more and more.

(3) Land acquisition policies of the Corps of Engineers, Bureau of Reclamation, and the TVA have changed since initial phases of the program which acquired large amounts of land in fee simple ownership. In the middle and latter 1950's, policies were utilized in which smaller amounts of land were acquired in fee simple ownership and larger amounts were controlled by

easement. Latest policies of the Corps and Bureau enable additional land to be acquired in fee simple ownership for more adequate provision of public access and development of recreation at reservoirs. When less land is acquired in fee simple ownership, more land will be controlled by easement or developed by free enterprise.

(4) Lease revenues and benefits received from construction of reservoirs usually more than compensates for losses occurring from the taking of agricultural land out of production.

(5) Demands for reservoir recreational shoreline usage are increasing due to higher personal incomes, more leisure time and better transportation networks. Demands are increasing for permanent homesites, other residential uses and commercial uses, and to some extent, industrial uses.

(6) There is need for control of private land around reservoirs. The need is the greatest for adequate land use planning and subdivision control, which includes provisions for promoting adequate sanitation, water supply, and related public facilities.

(7) Nearly all control of private land contiguous to reservoirs in the states has been undertaken at local levels of government, which has generally proven to be inadequate. Public land is controlled by the agency owning or leasing it. There is a trend for state agencies to cooperate more with federal agencies in pre-construction planning of federal impoundment areas. State agencies should participate to a greater degree with federal agencies in acquisition of land for access and recreation in reservoir areas. If state agencies would undertake more pre-planning for anticipated access and recreation needs

of future reservoir sites, federal agencies might possibly give more consideration for acquisition of additional land to meet these needs.

(8) There are a number of state agencies in Kansas, partially involved in reservoir development; their control responsibilities are generally applicable to public lands only and serve mainly in an advisory capacity to private enterprise. The responsibilities of these agencies may overlap, be duplicated, or often leave gaps in promoting good development in reservoir areas.

(9) There is no state legislation which specifically authorizes reservoir land use planning and control in Kansas; however, certain existing statutes might be utilized to undertake this responsibility.

(10) Existing state planning legislation could be amended as indicated previously to provide land use planning and control in reservoir areas; local governing bodies would be responsible for planning and implementation, which has not been too successful in the past.

(11) It is recommended that state enabling legislation be adopted as drafted previously to provide reservoir land use planning and control from the state level. A state agency, the Kansas Economic Development Commission, should provide technical staff for land use planning and control of land in reservoir areas. The KEDC should attempt to encourage local governing bodies to implement plans and control. The professional staff of the KEDC should provide technical assistance to local planning commissions at all times.

(12) For optimum development of the state, and small municipal planning, a state planning agency should be established. Reservoir land use planning and control should be undertaken by the state planning agency at that time.

Good development of reservoir shoreland and provision of adequate access to shorelines can become noteworthy stimuli to economic growth in Kansas. High land values can be maintained from proper development, and the recreational potential of the lakes can be realized by state and out-of-state residents. Water utilized from these reservoirs for irrigation and municipal supplies can boost the economy of an agricultural area or permit a municipality to expand its water supply facilities to serve additional population and industrial growth. These advantages will well reimburse the costs of time and effort expended in promoting good reservoir shoreland development.

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APPENDIX A

I hope to finish the requirements which lead to a Master's Degree of Regional Planning at Kansas State University this Summer. My thesis research is concerned with control of private land around public reservoirs.

I would appreciate it very much if you could send me information which reveals the devices through which land is controlled around the public reservoirs in _____ (name of state). Specifically, I'm interested in the enabling statutes that authorize control, the methods of control (zoning, public health regulations, etc.), the means by which controls are implemented, and the degree of effectiveness of these controls.

Thank you very much.

Sincerely yours,

Maurice L. Miller

APPENDIX B

CALIFORNIA DEPARTMENT OF PUBLIC HEALTH
Regulations for Multi-purpose Reservoirs
Proposed Subject Matter Coverage

3/13/63

1. Statement of Intent
2. Definition of Multi-Purpose Reservoir
3. Kinds of Recreation to be Permitted
4. Zoning of Areas for Recreation Activities
   a. Zoning by area
   b. Zoning by days
   c. Restricted zones
5. Environmental Sanitation Requirements
   a. Water supply to site
   b. Sewage disposal (including boats)
   c. Food sanitation
   d. Refuse disposal
   e. Vector control (insects, rodents, etc.)
   f. Toilet facilities (including maintenance)
   g. Control of pets
   h. Use of chemicals (on land or in water)
   i. Fish cleaning facilities
   j. Boat washing facilities
   k. Bilge water disposal
6. Reservoir Water Quality
   a. Bacteriological
   b. Chemical (including organic compounds)
   c. Physical (turbidity)
7. Safety Requirements
   a. Life-saving
   b. Boating safety
   c. Supervision of bathers
   d. Rescue
   e. Signs and warnings
   f. First aid
8. Regulation of Boats
   a. Launching facilities
   b. Patrol of boating area
9. Turbidity Control
   a. Land erosion
   b. Power boat turbulence
10. Control and Management of People
    a. Notices and instructions
    b. Access control
    c. Police protection
11. Program of Inspection of Operator
12. Procedure for Closing

APPENDIX C

Regulations Governing Construction Involving Sewage Disposal and Water Supply in the Nevada Portion of the Lake Tahoe Watershed

Permit Required

Reg. 1. A written permit must be obtained from the Division of Public Health Engineering of the Nevada State Health Department, before any type of construction, ultimately involving sewage disposal or water supply for drinking or sanitary purposes, is commenced within the Lake Tahoe Watershed. There is no charge for this permit.

Information To Be Furnished

Reg. 2. The request for a permit shall be accompanied by the following information:

a. Name and address of the owner or person in control of the land to be built upon.
b. Specific location of the building site, such as name of subdivision and lot and block designations, or the survey description of the land and some reference to nearby features, such as neighbors, roads or named placed.
c. Name and address of the builder.
d. A reasonably accurate sketch or plan of the building site and proposed construction showing:

   (1) The number of bedrooms in the case of private dwellings or the number of persons to be accommodated in construction other than private dwellings.
   (2) The existing, or proposed location of the private water supply, if any, on the property to be developed, and the adjacent properties.
   (3) The distances between the disposal portion of the sewerage system and the nearby water supplies, if any.
   (4) The direction of the ground slope and characteristics such as trees or rocky or marshy areas, or other obstacles to satisfactory sewerage disposal.

e. Specifications with regard to the private water supply, if any, the septic tank and the disposal portion of the system shall accompany the sketch or plan, or the plans may be enlarged to show details and construction materials in lieu of specifications.

Inspection of Site

Reg. 3. An inspection of the proposed construction site may be necessary and consequently cause some delay in processing the application for a permit.

Permit Expiration

Reg. 4. Permits shall be valid for one year only. Application may be made for renewal.

Occupancy Subject to Approval of Construction

Reg. 5. No structure requiring a permit under these regulations shall be occupied until the installation of the water supply and/or the sewage disposal system have been approved in writing by a representative of the Division of Public Health Engineering of the State Health Department.

Commercial Construction Permits

Reg. 6. Requests for construction permits for other than private dwellings, shall be considered individually with regard to water supply and sewage disposal requirements.

Reference Guides and Illustrations

Reg. 7. The United States Department of Health, Education and Welfare, Public Health Service Publication No. 526, "Manual of Septic Tank Practices," and the Nevada State Health Department publication entitled "Individual Sewage Disposal Systems", and amendments thereto or modification of the above publications, shall be the guide and a part of these regulations in considering requests for permits to construct sewage disposal systems, and in making inspection of the completed installation. Construction of sewage disposal systems shall be in accord with the abovementioned publications herewith adopted as a part of these regulations. Data on soil percolation tests and soil characteristics available to the State Health Department and actual percolation tests and excavations made by the owner on the properties in question, will be used to determine the feasibility of sewage disposal.

Land Subdivided Prior to 1949

Reg. 8. Land lying within the Lake Tahoe watershed area of Nevada that has been subdivided prior to the enactment of NRS Chapter 445.080 to 445.120 will be examined upon request with regard to plans for sewage disposal, and water supply, and consideration given wherever possible for a construction permit. Wherever a satisfactory plan for sewage disposal cannot be devised, a permit for construction will not be issued.

Areas Required for Dwelling Construction

Reg. 9. All land within the Lake Tahoe Watershed, other than land subdivided prior to the enactment of NRS Chapter 445.080 to 445.120, intended to be used for construction of one-family dwellings, shall be subject to the following provisions:

a. Land without provisions for either community water supply or community sewage disposal, shall have an area of not less than 1/2 acre (21,780 sq. ft.), providing that the sewage disposal system and the source of the water supply or any water supply on adjacent property shall be separated by not less than 100 feet, and also taking into consideration underground characteristics that may induce contamination at greater distances.
b. Land having available a community water supply but no community sewage disposal system shall have an area of not less than 1/4 acre net (10,890 sq. ft.), with an allowance in area of plus or minus 10 percent in individual lots in subdivisions where the arithmetical mean area of all the lots is 1/4 acre.
c. Land having available both approved community water supply and sewage collecting systems shall be governed in area by the requirements of zoning ordinances, where these exist, or by individual desires where unzoned.

Subdivision Plans

Reg. 10. Plans for subdivisions in the Lake Tahoe Watershed shall be submitted to the Division of Public Health Engineering of the Nevada State Health Department, before such subdivision plans are recorded or presented for final approval by zoning authorities. Such subdivision plans shall comply with the regulations authorized under NRS Chapters 445.080 to 445.120. Approval of subdivision plans does not imply approval of individual lots found later, upon examination, to be unsuitable for individual sewage disposal systems. An inspection of the proposed subdivision may be necessary and consequently cause some delay in processing the plans.

Community Water Supply and Sewage Disposal

Reg. 11. Plans and specifications for public or community water supply and sewage disposal systems to serve communities or subdivisions in the Lake Tahoe Watershed shall be in conformity with the "Water Supply Regulations" and the "Water Pollution Control Regulations" of the State Board of Health, and any other pertinent laws and regulations and such plans and specifications shall be presented to the Division of Public Health Engineering of the State Heal th Department, and written approval secured before any construction or installation is commenced.

Penalty

Reg. 12. NRS 445.120 provides: Any person, firm, association or corporation violating any of the provisions of NRS 445.080 to 445.110, inclusive, or of regulations 1 to 12 inclusive, hereby established, shall be guilty of a misdemeanor, and upon conviction thereof shall be punished by a fine of not more than $500, or by imprisonment in the county jail not to exceed 3 months, or by both fine and imprisonment.

APPENDIX D

PROPOSED RECOMMENDATIONS FOR CONTROL OF POLLUTION OF RESIDENTIAL LOTS ON THE CATAWBA RIVER RESERVOIR IN NORTH CAROLINA

1. Plans of Subdivision: Plans for proposed subdivisions should be submitted to the local health department of the county involved for review and approval prior to recording of the plat. The purpose of this recommendation is to facilitate orderly and uniform development of the areas adjoining the reservoirs, regarding the proper location of building site, water and sewage facilities. Percolation tests are desirable prior to making final layout of the subdivision. The local health department should have representation on the Planning Board in their jurisdiction.

2. Minimum Lot Size: In order that the lot may accommodate water and sewage facilities, it is recommended that the minimum lot size be established at 20,000 square feet. It is suggested that this minimum be 100 feet in width and 200 feet in depth. Results from percolation tests may indicate requirements for a larger lot size.

3. Water Supply: Individual wells should be located at least 50 feet from any source of pollution. In order to obtain maximum lot utilization, it is suggested that all wells be located at least 40 feet from any property line other than property lines adjoining streets. Wells should be protected in accordance with the North Carolina State Board of Health bulletin No. 476.

4. Sewage Disposal: Sewage disposal facilities shall meet the requirements and regulations of the local health department of the county involved. For all new construction it is recommended that a permit for the sewage disposal system be obtained from the county health department prior to starting building construction. It is recommended the following minimums be established.

   (a) Capacity of Septic Tank — 1,000 Gall.
   (b) Distance, absorption field to building foundation — 10 Feet
   (c) Distance, absorption field to property line — 10 feet
   (d) Horizontal distance, system to high water mark — 50 Feet
   (e) Percolation tests are desirable to determine size of disposal system. See bulletin No. 519 for recommended rate table.

5. Refuse storage, collection and disposal:

   (a) Storage: No refuse shall be allowed to accumulate on premises, unless it is stored in a manner approved by the local health department.

APPENDIX D
Continued

It is recommended that containers be constructed of metal and with fly-tight covers.

(b) Collection: It is recommended that, where applicable, the local health department encourage the establishment of contractual refuse collection services.

APPENDIX E
RESERVOIR SANITATION LAW
OKLAHOMA STATUTES
Title 63, O.S. 1961, Sections 625, 1-625, B
R E S E R V O I R S

625.1 Purpose of law. - The purpose of this Act is to protect the purity and freedom from contamination of waters in reservoirs of this State and to control malaria, in order to protect and conserve public health.

625.2 Definition of reservoir. - (a) As used in this Act, "reservoir" shall include any reservoir, whether completed or in the process of construction, whether or not used as a water supply, and whether or not constructed by any recipient of water therefrom. Provided, however, that the word "reservoir" as defined herein shall not include any lake, body of water, or reservoir owned and controlled by any municipality, city or town shall by duly enacted ordinance elect to come under the provision of said Act; provided further, that the provisions of this Act shall not apply to impounded water on privately owned land not open to public use.

(b) The drainage of any reservoir shall include all the water collection area adjacent to the highest waterline of the reservoir which may be construed by the State Commissioners of Health as n ecessary to adequately protect the waters of the reservoir. The area may extend upstream on any watercourse to a point within six hunderd (600) feet of the highest waterline of the lake.

625.3 Rules and regulations. - (a) The State Board of Health is hereby authorized and directed to make rules and regulations for the control of sanitation on all property located within any reservoir or drainage basin. Said rules and regulations shall include but not be limited to rules and regulations:

APPENDIX E
Continued

(1) relating to the collecting and disposing of domestic and industrial wastes within the area above described;

(2) prohibiting the dumping of garbage, trash, or other wastes or contaminating material within such area;

(3) providing that all wastes originating within such area shall be disposed of in a manner approved by the State Board of Health, and that the plans and specifications for any disposal system shall be approved by the Engineering Bureau of the State Board of Health prior to the construction of any such system, except that plans for sewage disposal systems for individual homes or cabins need not be submitted for approval, provided the installation is made in accordance with the requirements of the State Board of Health.

(b) Nothing in this Act shall be construed as authorizing the State Board of Health to control or regulate or to make rules or regulations relating to the control or regulation of the collection or disposal of waste or contaminating materials by any industry where the collection or disposal of such waste or contaminating material by said industry is, on the effective date of this Act, subject to control or regulation by any board, agency, commission, or adminstrative body of the State of Oklahoma.

625.4 Cooperation in clearing area and controlling malaria. - All persons, firms, corporations and governmental agencies that impound any body of water for public use shall cooperate with the State Board of Health in clearance of the area and the measures necessary to control malaria.

APPENDIX E
Continued

625.5 Additional officers and employees - Expenses. -The State Board of Health may appoint or employ such additional officers and employees, and may incur such expenses as may be necessary to enforce the provisions of this Act and the rules and regulations promulgated hereunder.

625.6 Cooperative agreements. - The State Board of Health may enter into cooperative agreements with the United States Government, the State of Oklahoma, or with any of their agencies or subdivisions, relative to the rules and regulations promulgated hereunder.

625.7 Other laws not repealed or limited. - The provisions of this Act shall not operate to limit or repeal any other Act relating to sanitation or to the protection from contamination of the waters of this State.

625.8 Violators guilty of misdemeanor - Any person violating the provisions of this Act or the rules and regulations issued hereunder by the State Board of Health shall be guilty of a misdemeanor.

Rules and Regulations

Officially adopted by the State Board of Health, September 10, 1961 at Oklahoma City, Oklahoma.

Pursuant to the powers vested in the State Board of Health in Title 63, O.S. 1961, Section 625,3, the following Rules and Regulations for the control of sanitation with the boundaries described in said Act are hereby declared to be in effect.

APPENDIX E
Continued

SECTION 1. The purpose of these rules and regulations is to protect the purity and freedom from contamination of waters in reservoirs in this State, in order to protect and conserve public health.

SECTION 2. Definitions. As used herein the following terms, unless the context clearly indicates otherwise, shall have the following meanings:

1. "Reservoir" shall include any reservoir, whether completed or in the process of construction, whether or not used as a water supply, and whether or not constructed by any recipient of water therefrom. Provided, however, that the word "reservoir" as defined herein shall not include any lake, body of water or reservoir, owned and controlled by any municipality, city or town of this State, unless such municipality, city or town shall by duly enacted ordinance elect to come under the provision of said regulations. Provided furthere, that the provisions of these regulations shall not apply to impounded water on privately owned land not open to public use.

2. "Sewage" means all human body wastes.

3. "Waste" means all disposable materials other than sewage including garbage and/or trash or any contaminating material.

4. "Boat" shall mean all self-propelled water craft or vessels primarily designed for water travel or transportation.

5. "Barge" shall mean all other structures other than "boats" that may be on or over the water at its highest level, either floating or on stationary piers. This term shall not exclude pontoon type self-propelled fishing craft which by reason of its power or maneuverability may not be classified as a boat designed for transportation.

APPENDIX E
Continued

6. "Marine Toilet" shall mean any sewage or waste discharging fixture on or within a "boat" as that term is defined herein.

7. "Cottage" means any type of structure designed, equipped or suitable for living quarters with or without permanent living facilities whether movable or stationary.

8. "Concession" means any type of structure or structures designed, intended or suitable for offering service to the public in any manner whether movable or stationary, and shall include but not be limited to foodhandling establishments, rental cabins (by day or otherwise), trailer parks, youth camps and church camps.

SECTION 3. Marine Toilets, Restrictions On. After the effective date hereof no marine toilet or any "boat" operated within 600 feet of the high water line of any reservoir of this State shall be so constructed and operated as to discharge any inadequately treated sewage or waste into said waters directly or indirectly. No boat shall be so equipped as to permit discharge from or through its marine toilet, or in any other manner, of any inadequately treated sewage or waste at any time into waters of this State, nor shall any container of inadequately treated sewage or waste be placed, left, discharged, or caused to be placed, left or discharged within 600 feet of the high water line of any reservoir of this State by any person at any time whether or not the owner, operator, guest or occupant of a boat. Marine toilets shall not be permitted on "barges".

SECTION 4. Marine Toilets, Manner of Operation. After the effective date hereof any marine toilet located on or within any boat operated within 600 feet

APPENDIX E
Continued

of the high water line of any reservoir of this State shall have securely affixed to the interior discharge openings of such toilet or other waste discharging fixture a suitable treatment device in operating condition containing as an integral part thereof a mechanical pulverizer or grinder with a chlorinating unit connecting thereto or some other treatment facility or method authorized in writing by the State Commissioner of Health or his authorized representative. All sewage or waste discharged from any "boat" shall pass solely through such devices subject to limitations contained in Section 6.

SECTION 5. Disposal of "Sewage" or "Waste". No "sewage" or "waste" shall be discharged from any "barge" into any part of a reservoir that is within the purview of these regulations. "Barges" shall not be equipped with living quarters or utilized for human habitation.

SECTION 6. "Boats" shall not be utilized for human habitation at a fixed or permanent mooring point or within areas adjacent to any boat dock, barge, beach, water intake line or any other areas that may be so restricted. The discharge of properly treated sewage and/or waste from a "boat" shall be permitted only when underway in deep waters other than embayments.

SECTION 7. Sewage Disposal Systems. All "cottages" and/or "concessions" shall be provided with sewage disposal systems meeting the approval of the State Commissioner of Health. Sewage disposal systems shall conform to O.D.H. Engineering Bulletin No. 600 if single cottage installation with water under pressure or O.D.H. Privy Bulletin No. 599 or "Small Sewage Treatment

APPENDIX E
Continued

Systems" Manual published by the Division of Sanitary Engineering, revised February 1, 1959 if larger installation is required.

SECTION 8, Water Supply Systems - "Cottages." All "cottages" with water under pressure should have a water supply system approved by the State Commissioner of Health.

SECTION 9. Water Supply Systems - "Concessions." All "concessions" shall be provided with a water supply system meeting the minimum requirements of the following applicable bulletins. If a ground water supply from:

1. Dug Well - O.D.H. Engineering Bulletins 0579, 0581 and 0580.
2. Drilled Well - O.D.H. Engineering Bulletins 0579, 0583 and 0580.
3. Driven Well - O.D.H. Engineering Bulletins 0579, 0584 and 0580.

If a water supply is from a surface pond or lake: O.D.H. Engineering Bulletin 0587 supplemented by O.D.H. Bulletin No. 0591.

SECTION 10. Community Water Supply Systems. Any person or persons supplying water under pressure for domestic purposes to any property or structure other than his own, whether receiving payment for same or not, is supplying water to the public and shall comply with all provisions of Title 63, O.S. 1951, Section 613 which requires a written permit from the State Commissioner of Health for such action.

SECTION 11. Plans to be Submitted - "Concessions." Plans for sewage

APPENDIX E
Continued

disposal systems and water supply systems to serve "concessions" shall be submitted for advance approval by the State Department of Health.

SECTION 12. Waste Disposal. The liquid waste from kitchens or rooms where food or drink is prepared or served shall be discharged into the sewage disposal system. All garbage and trash shall be kept in suitable tightly covered receptacles in such a manner as not to become a nuisance. Sewage, water and waste disposal requirements shall also apply to all park or picnic areas provided for public use by any agency or individual, whether on privately owned land or public lands.

SECTION 13. Dumping. The dumping of garbage, trash or other wastes or contaminated material within said area is prohibited.

SECTION 14. Penalty. Any person who violates the provisions of these rules and regulations shall be guilty of a misdemeanor as provided in Title 63, O.S. 1961, Section 625.8.

CONTROL OF LAND CONTIGUOUS TO FEDERAL RESERVOIRS

by

MAURICE LEE MILLER

B. A., Kansas State University, 1961

AN ABSTRACT OF A MASTER'S THESIS

submitted in partial fulfillment of the

requirements for the degree

MASTER OF REGIONAL PLANNING

College of Architecture and Design

KANSAS STATE UNIVERSITY

Manhattan, Kansas

1964

Development of land is occurring adjacent to federal reservoirs in Kansas. In most cases, this development is occurring without prior land use planning and implementation of land use controls. By 1975, it is anticipated that there will be twenty-three federal impoundments in the state and an increase in land development activities in these areas. The major purpose of this thesis was to investigate this situation; specifically the purposes were: (1) to explore the existing problems in reservoir shoreline development and the need for land use controls, (2) to summarize the controls utilized in the fifty states, (3) to appraise the Kansas situation and (4) to submit a solution or solutions which would promote good land development practices in Kansas reservoir areas.

Experiences at TVA, Corps of Engineers and Bureau of Reclamation reservoirs indicate that demands are increasing for recreational, residential, commercial and, to some extent, industrial land uses adjacent to reservoirs. The greatest need to promote good development contiguous to reservoirs is adequate land use planning and subdivision control which includes provisions for promoting adequate sanitation and water supply.

Data utilized from forty-eight state planning, water resource, and health agencies indicate that nearly all control of private land contiguous to reservoirs has been achieved through local governmental action which has generally proven to be inadequate due to the lack of interest and initiative of these bodies in implementing land use planning and control procedures. Public land or private land in easements are controlled by federal or state agencies. These agencies maintain strict control policies, and it appears that few land development problems occur in these areas. There is a current trend for state agencies to co-

operate more with federal agencies in reservoir pre-construction planning which would tend to promote coordination in providing adequate land for public access and recreation.

There are a number of state agencies in Kansas involved in reservoir development; however, their responsibilities are generally applicable to public lands only and serve mainly in an advisory capacity to private enterprise. The responsibilities of these agencies may overlap, be duplicated or often leave gaps in promoting good development in reservoir areas.

There is no state legislation in Kansas which specifically authorizes reservoir land use planning and control. State statutes which establish metropolitan or regional planning commissions and county planning boards could be amended to authorize reservoir land use planning and control. To insure optimum development near reservoirs, it is recommended that new state enabling legislation be drafted to provide reservoir land use planning and control from the state level. A state agency, the Kansas Economic Development Commission, should provide technical staff and leadership for this operation and encourage local governing bodies to prepare and implement local plans and controls. If a state planning agency is established, reservoir land use planning and control should be undertaken by this agency.