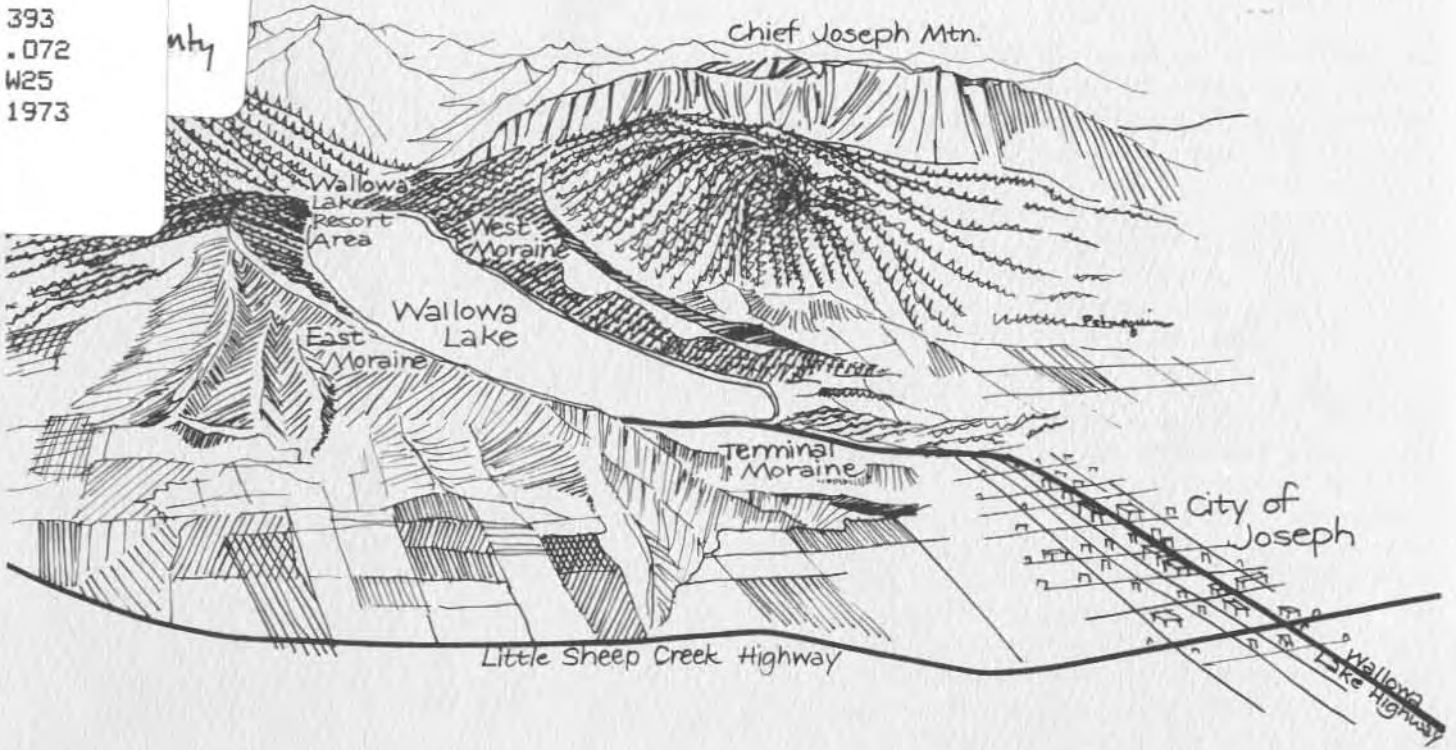


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Wallowa Lake Basin Comprehensive Plan

May 1973



prepared by
Stevens, Thompson & Runyan, Inc.

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BACKGROUND

This study was initiated because of the concern expressed by local residents and by County officials over the possible pollution of Wallowa Lake as a result of increased development and recreational activities. During June 1972, the County retained the firm of Stevens, Thompson & Runyan, Inc., to prepare a comprehensive plan for Wallowa Lake Basin. The study was also to include the area in and around the City of Joseph.

Funding for this study was secured through a "701" Planning Assistance Grant from the State of Oregon. The County participated by providing a 1/3 matching share through related services performed by County personnel.

SCOPE OF THE STUDY

The basic goal of the study is to provide an environmental protection plan for the Wallowa Lake Basin. This will be facilitated through three general tasks:

1. Development of a land use plan,
2. Development of a water and sewerage facilities plan, and
3. Review of existing zoning policies as they would be affected by the land use plan.

The study area was defined as Wallowa Lake, the City of Joseph and their environs within an approximate two-mile range. In addition to this publication, a supplement is available which presents more detailed data concerning various aspects of this study.

HISTORY

Until the arrival of white man, the Wallowa Country was the indisputable territory of the Nez Perce. The earliest exploration was conducted during period 1834-35 by Captain Bonneville on behalf of the U. S. Government. Although claimed by the Nez Perce, the Wallowa Valley was opened to settlement as the government attempted to induce the Indians to leave their ancestral homeland to live on reservation lands in Idaho. Negotiations failed and increased pressure from the settlers eventually necessitated the Army's attempt to forcibly move the Nez Perce. Thus, in 1877, began the famous Nez Perce retreat under the leadership of several chiefs, including young Chief Joseph. The Nez Perce were at first successful in defeating the troupes, but after a long and difficult journey ending in a bitter battle in Montana, the Indians surrendered.

Once the Indians had been forced from the Wallowa Country, the area was open to settlement without opposition. Many settlers came because of the lure of gold in the mountains; others came because of the fertile Wallowa Valley.

WHY PLAN?

Some initial questions which may be asked by many local residents are: why should a small community be involved in formulating a land use plan; what is a land use plan; and what is it to accomplish?

To begin with, the State of Oregon, in 1969, through legislative action, enacted a bill which requires all counties and incorporated cities to develop a land use plan and to enact zoning. Besides the necessity to meet state requirements, land use planning has other immediate benefits to local communities. In essence, the land use plan is intended to be a guide for the rational expansion and growth of the community as well as a means of maintaining the livability of the environment.

Since the postwar years of the 1940's, cities and counties have had to face on a continuing basis a vastly increasing number of problems. The result has been that local governments have had to engage in a wider variety of activities and services. Simultaneous with this expansion has been increased governmental cost and, in turn, additional costs to the taxpayer. Therefore, the basic premise of land use planning is that planned future growth will be far less costly to the taxpayers than helter-skelter, unplanned development. This can be continually borne out by the day-to-day decisions concerning services which face communities—police and fire protection, sewer and water facilities, road construction and maintenance, parks and recreation, construction of public buildings, etc.—all of which are costly. The land use plan is, therefore, a means of guiding future growth, so local government will have a clear understanding of the kinds and amounts of services and expenses they will be facing in the future. The long-range result is a financial saving to the community, since day-to-day decisions can be coordinated and directed toward an identified end result.

Land use planning is also a means of protecting the citizens' investment in their community. The plan allocates certain areas to specific uses by attempting to relate compatible uses while separating those which are incompatible with one another as well as preserving lands which have historic, scenic, aesthetic or natural value. This, in turn, has a direct effect on the livability of the environment and maintaining higher property values.

LAND USE PLAN COMPONENTS

By their very nature, land use plans tend to be fairly general. This is a result of the practical need to develop and utilize long-range policies of land use while at the same time providing flexibility within the plan in order to avoid obsolescence as long as possible. This infers another inherent characteristic of land use plans which must be recognized—the need for periodic review and updating. This, like any other plan, is based on the best information available at the time. Future conditions and increased knowledge will require modification of the plan at various stages. If updating of the plan does not occur, it will most likely become outdated at some point in the future.

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The following discussions comprise a summary of the various data which influenced the plan. As will be evident, the proposed land use plan is based, to a great degree, on the suitability of the land to support various uses. In this manner, anticipated development can be directed to appropriate areas allowing its integration into the environment without completely destroying the natural character of the lake basin.

EXISTING LAND USE. Fortunately, development has been confined to relatively small areas. Joseph and the south lake resort area comprise the major developments and each is fairly confined. Even the north shore development is relatively close together. However, the area most difficult to deal with is the scattered vacation development spread along the west moraine. Here, rather than urban sprawl, a recreation sprawl is occurring. Sprawling development, no matter what kind, always proves to be expensive to the taxpayer. Any time services such as water, sewer, roads and police and fire protection are provided for a small number of people spread over a large area, the cost is more expensive than providing services to more people living closer together. Simply stated, it will be far more expensive to provide services to the existing development on the west moraine than it will be for the same services in the City of Joseph.

The remaining land area is either utilized for agriculture, open space or timber. The amount of undeveloped land has helped to maintain the natural, scenic quality of the region which, in turn, is the prime attraction for the tourist. Essentially, the area has not yet been spoiled by overdevelopment or by development which has occurred in the wrong places.

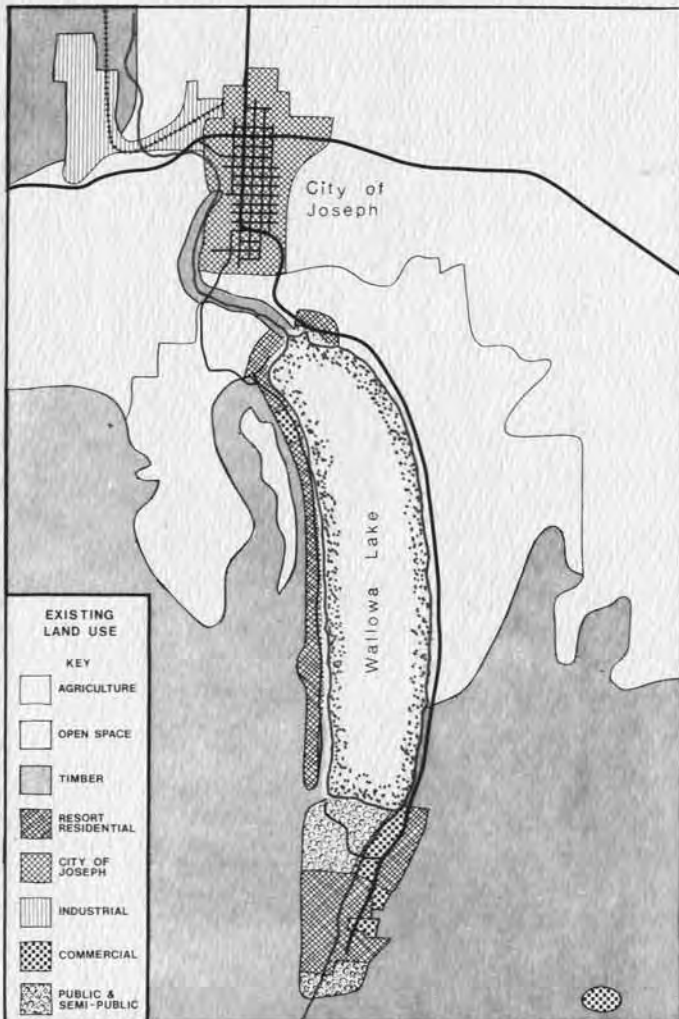
POPULATION. For purposes of this study, two sets of population were considered: permanent population and recreation population. Permanent population includes year-round residents while recreation population includes seasonal users and tourists. The vacation population is critical to the design of water and sewerage facilities, since the permanent population constitutes only a small fraction of the total lake area usage.

Current figures indicate the permanent population of the Joseph area to be about 1,000 persons, while the lake area contains less than 100 year-round residents. However, adding the overnight recreation population changes these figures significantly. The south lake resort area alone is capable of supporting around 1,500 persons on an overnight basis while the west and terminal moraines could accommodate 100-150 persons.

It is expected that Joseph will increase its population about 50% in the next 20 years, or a population around 1,500 persons. The south lake will probably continue to be dominated by vacation usage rather than by permanent residents. Therefore, an approximate year-round population of 2,000 persons could be expected within the study area within the next 20-year period. Peak recreation population, including day use, could be expected to reach a range between 2,500 and 3,000 within the lake basin.

ECONOMICS. Mining and agriculture were the main incentives which attracted the original settlers. Today, agricultural activities still play a dominant role in the Wallowa County economy while mining activities have almost ceased. The lumber and forest products industry has also played an important role in the economy, however, in the past decade, recreation has become an influential factor.

Within the study area, recreation, lumber and agriculture all play a viable role in the local economy. The south lake area is totally dependent on the recreation market, while the area east of Joseph contains some of the best agriculture lands in the area. The retail trade in the City of Joseph profits from both of these areas as well as from the lumber mill west of town. It is likely that these segments of the economy will continue to contribute to the local market with recreation, becoming increasingly dominant.



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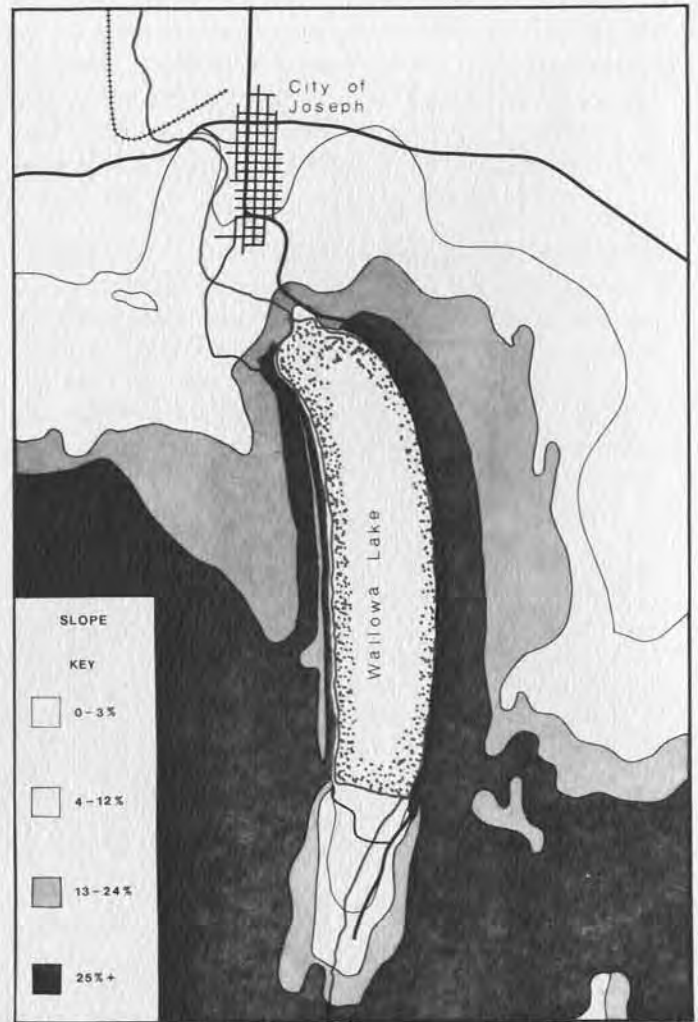
GEOLOGY. The Wallowa Mountains, which reach as high as 10,000 feet, were essentially formed by the cooling of igneous magma which was later uplifted primarily by faulting. Erosion followed removing the surface lava flow, thus, exposing the underlying igneous rocks, granites and granodiorites. Much of the erosion was the result of extensive glacial activity during the last ice age.

The most descriptive evidence of the phenomenal power of glacial erosion is the Wallowa Lake Basin located at the mouth of the Wallowa Canyon. The lake, which lies above the alluvial fan of the valley, was formed by two massive lateral moraines and by a terminal moraine which formed a natural dam. The lateral moraines are extremely steep and are composed of glacial debris, most of which is highly unstable material. From the bottom of the lake, the moraines reach approximately 1,100 feet at the mouth of the canyon.

The major value of the lake and the surrounding mountains is for use as water supply and for recreational activities. Much of the success of the agricultural activities in the valley area is attributed to extensive irrigation resulting from the mountain watersheds and the holding capacity of Wallowa Lake. Likewise, recreational activities are being centered around use of the lake and the close proximity of the Eagle Cap Wilderness Area. The dominance of agriculture and recreation as major land uses will most likely continue in the future. Fortunately, both can remain compatible if proper land use policies are enacted.

NATURAL AMENITIES. Unquestionably, the most valuable asset of this area is its unspoiled natural beauty. These natural amenities include the lake, the remarkable moraine formations, the scenic mountains comprising the Eagle Cap Wilderness Area, and the heavy timber in the National Forest area. These amenities are the elements which attract sportsmen and vacationers to this area. These people, in turn, support the recreational economy of the Wallowa Lake area. As a result, preservation of these scenic areas is absolutely essential to the local economy.

Fortunately, the lake basin area has not been overdeveloped, and the existing development blends well with the natural environment. Therefore, the comprehensive plan was created around the notion that the lake area should only sustain as much development as can be integrated into the natural environment without drastically changing the character of the area and without distracting from or destroying any natural amenity. As a result, this calls for additional development on a limited basis and then, generally, to occur only in areas of heavy vegetation where construction can blend with the landscape. Also, the plan seeks to protect a great deal of the east moraine from development. It is generally recognized by local citizens that this phenomenal moraine formation is a most unique geological feature which deserves preservation and that any kind of development facing the lake basin would be a severe visual detriment to the area.



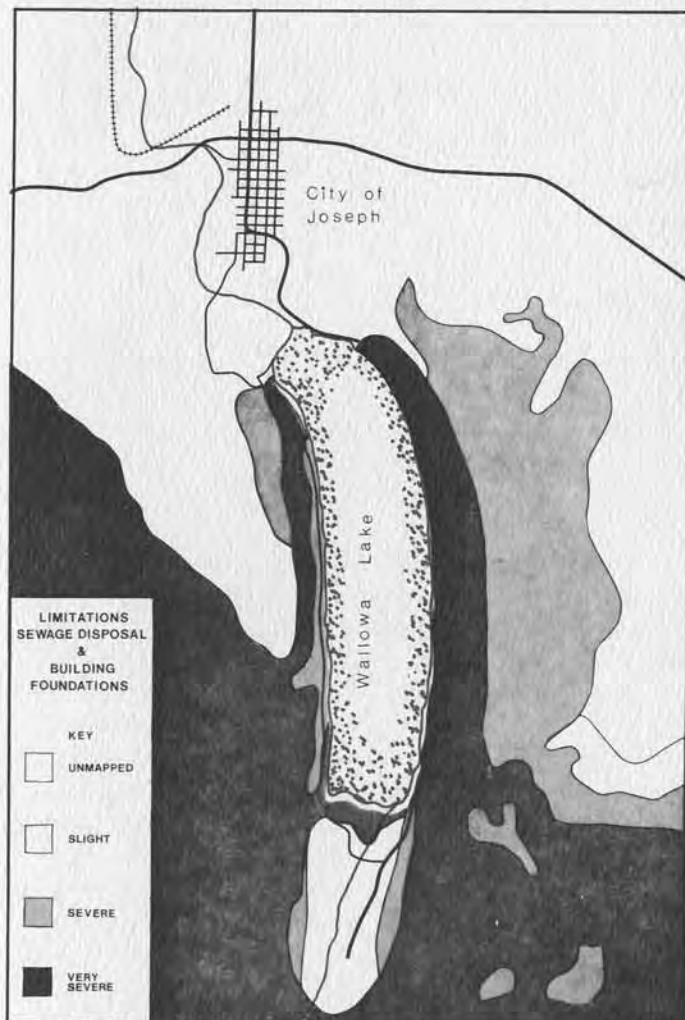
PHYSICAL CHARACTERISTICS. The natural topography of an area is most useful in determining development suitabilities. A slope map was made to illustrate this point. Four classifications were selected: 0-3%, 4-12%, 13-25% and above 25%. The 0-3 slopes, which means no more than 3 feet of elevation change per 100 feet, are the easiest and most economical to develop. It is also the area being used predominantly for agriculture. The 4-12% areas are perhaps the most desirable to develop for residential purposes, because the terrain is more interesting, and the slope usually allows for panoramic vistas. Once 12% is exceeded, building costs increase sharply. Excavation becomes a problem, expensive foundations are usually necessary and road building becomes difficult and expensive. Above 25% slope, general development is prohibitive.

As illustrated, the south lake area is best suited for development because of the more moderate slopes. With the exception of the north shore area, the lake sides do not readily lend themselves to development. The 13-24% slopes, which are considered a "severe" category, do not preclude development but, rather, indicate that proper precautions are necessary. Also, the costs of development on these slopes will be much higher. Slopes 25% and above are given a "very severe" rating. This is a result of the excessively steep topography and poor soil conditions, therefore, these areas are considered unsuitable for general development.

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Soils also play an important role in determining development suitability both in terms of subsurface sewage disposal and in foundation construction. Unfortunately, not all the soils in the study area have been mapped, therefore, only the existing information has been illustrated. In this instance, the general soils data regarding building suitability and drain field installation are identical.

Generally, the soils in the lower and flatter elevations have better drainage characteristics. As a result, the suitability for drain field and foundation construction is also better. As the slope increases, soil conditions change. The soils are generally shallow and have less desirable water movement characteristics which make proper functioning of subsurface sewage disposal systems more difficult. In addition, the stability, the shrink-swell characteristics, and the general bearing strengths of the soils begin to vary, thus requiring extra precautions in foundation design and construction. These characteristics also affect road construction as well. Generally speaking, as the slope increases, the soils become less suitable for development, and as the difficulty and hazards increase, the costs of development increase to the point where it is not only unsafe but economically unfeasible.



IMPLEMENTATION

If the land use plan that follows is to be an effective guide for future development, there must be a means of implementation, otherwise the plan is of no value and its formulation has been a meaningless exercise. Fortunately, three basic tools are available which, if properly coordinated, will facilitate implementation. These are: (1) zoning, (2) subdivision control and (3) capital improvements programming. Interrelated with these tools is the continual need for citizen involvement in planning programs, private investment and intergovernmental cooperation.

Of all the available tools, zoning is probably the most important legal device for carrying out the plan. Essentially, zoning is a means of insuring that the various land uses within a community are properly situated in relation to one another, that adequate space is available for different uses, and that the density of development in these areas is held to a point where it can be properly supplied with public services. Where the plan proposes land use for the future in a general manner, the zoning ordinance governs existing land use with definitive requirements. The zoning ordinance must be updated and modified in keeping with the plan or with any changes in the plan.

The subdividing of private lands can also be subject to prescribed standards of street and lot design, again conforming to the overall objectives of the land use plan. Subdivision control offers an opportunity for planning new additions to a community in accordance with the plan thereby enhancing future development while avoiding the reoccurrence of past mistakes.

A capital improvement program usually consists of a comprehensive list of needed public improvements and facilities. Water and sewerage facilities are typical examples. Generally, capital improvement programs are oriented to short-range periods and are a means of implementing, on a day-to-day basis, the objectives of the plan.

In order to maintain a workable plan, several other factors must be realized. First, the plan must receive continued review from the citizenry in order to keep it current with changes within the community. Second, it must be recognized that private development will be responsible for most of the growth within the community. Therefore, the development policies of the community must be specific enough to guide private developers thereby allowing orderly and efficient expansion. Third, intergovernmental cooperation will be a necessity. This means that the County, the City of Joseph, the State Parks Department, and any special districts such as school districts, fire districts, or water and sewer districts will need to work together on a cooperative basis to insure coordinated planning. If these factors are remembered and the proper planning tools are developed, a workable implementation program should be possible.

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LAND USE PLAN

During the course of this study, several meetings were held with the Board of County Commissioners, the County Planning Commission, the Lake Public Works Committee and interested citizens of the area. These meetings provided a forum for discussion of alternative development patterns in the preliminary planning stages. Initially, STR put forth two land use alternatives in order to generate interest and discussion on the part of the public. Each alternative presented a different but viable growth direction. The plan presented herewith is the result of the feedback from the citizens and public officials of Wallowa County.

Public reaction to the preliminary proposals indicated several general development parameters concerning the lake basin. These could be summarized as follows:

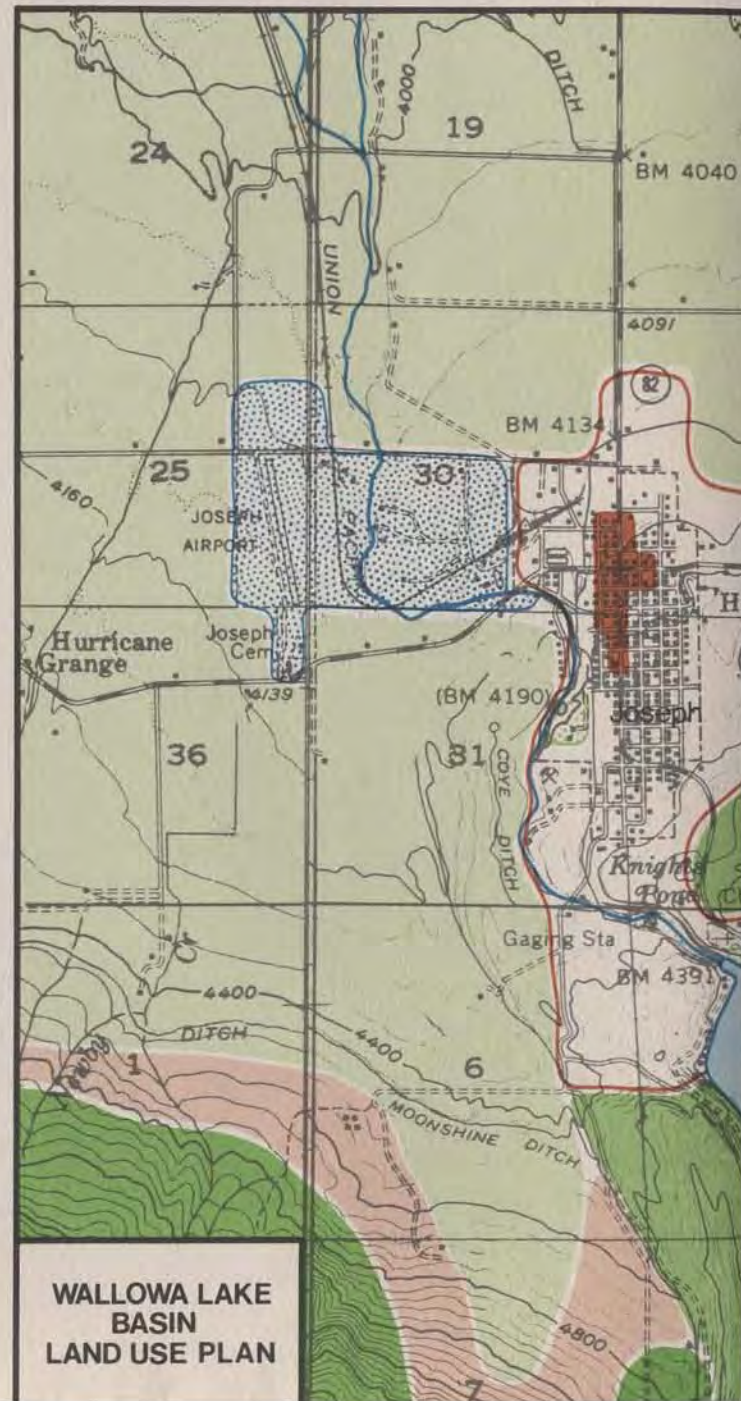
1. A need and desire to increase development, both permanent and recreational, within the lake basin;
2. Development, however, should be limited only to suitable areas, and development densities should be held to minimum levels in order to retain a resort character; and
3. The natural amenities and qualities of the area, which directly generate economic returns, should not be destroyed.

In response to these general guidelines, the physiographic characteristics of the area, and the existing land use pattern, the basic proposals of the land use plan can be summarized in the following manner:

1. The City of Joseph should be encouraged to expand as a rural community center;
2. Additional residential use should be encouraged at the north end of the lake;
3. The south end of Wallowa Lake should continue to develop as a resort and recreational area;
4. The west moraine should continue to develop as a recreational home area, but only along the existing road;
5. Portions of the east and west moraines should be placed in an open space classification in order to protect these unique geologic features from excessive development;
6. Prime agricultural lands both east and west of Joseph should be protected from encroaching development;
7. Certain areas outside the lake basin should be designated for large acreage rural residential uses; and
8. The water quality of the Wallowa Lake Basin should be protected by the provisions of public

Besides the moraines, the plan seeks to preserve good agricultural lands. Since agriculture plays a viable role in the economy, it seems only reasonable to preserve productive farm lands. The area east of Joseph contains some of the best agricultural lands in the County. Therefore, the plan proposes to maintain these lands by protecting the farmer from the pressures of development.

Additional lands have also been set aside for rural residential use. These areas are located between the prime agricultural lands of the valley floor and the steep slopes of the mountains and moraines. These areas would be composed of large acreage parcels—a minimum ten-acre size. This will allow areas for those wishing large lots while insuring adequate area for the proper functioning of subsurface sewage disposal without creating a health hazard. No public water or sewerage facilities are planned for these areas.



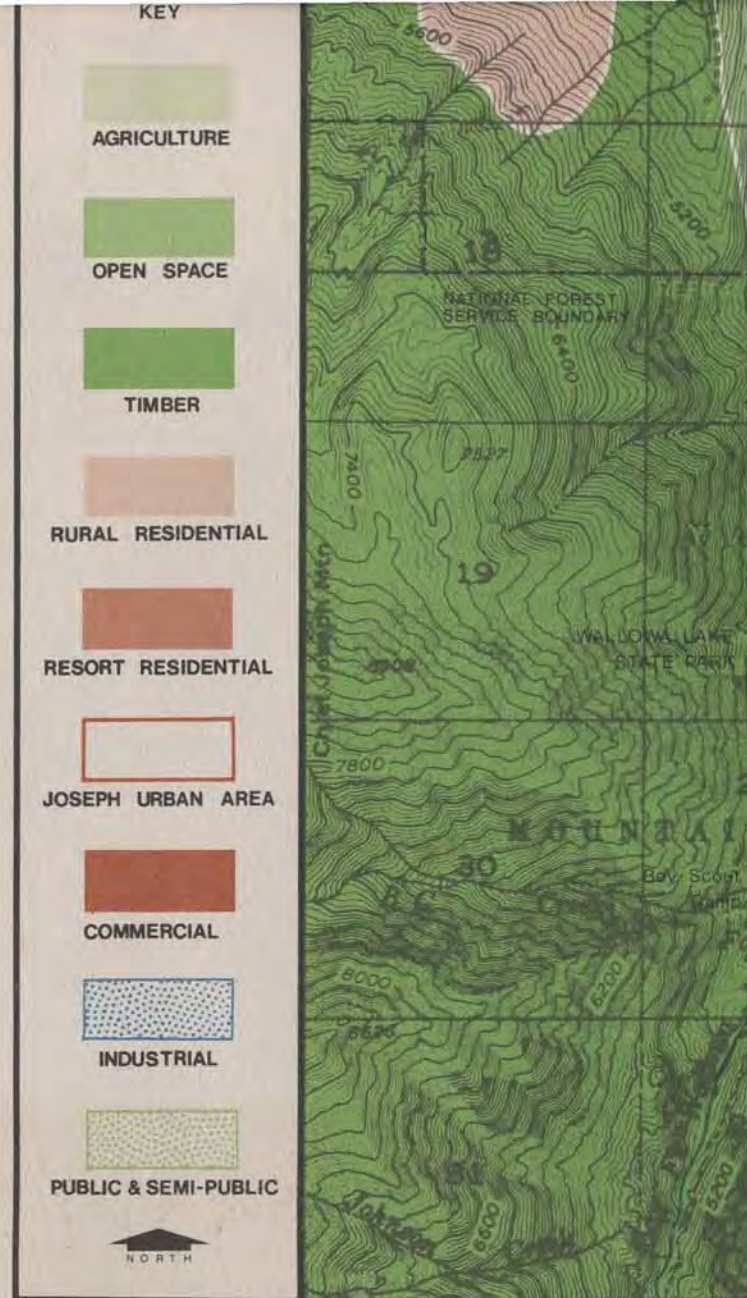
The City of Joseph will continue to function as a rural center serving the surrounding farming area as well as catering to the needs of the tourist and recreation trade generated by the lake basin area. Commercial development will, by necessity, continue to occur along the Wallowa Lake Highway and a few of the main intersecting streets in the center of town. However, provisions should be taken to prohibit the Wallowa Lake Highway from becoming a "strip" development between Joseph and Enterprise. Residential growth is proposed primarily to the east and south. There is adequate area available to double the current population of Joseph. In addition, lands already zoned for industrial use should be adequate for future expansion.

Based on physical and aesthetic considerations, the south end of the Wallowa Lake Basin is by far the most suitable area for development. This relatively level and heavily forested area has allowed recreational development to occur without producing the feeling of a densely populated area. The plan proposes that this area continue to develop commercially and residentially, but only to a density of about five persons per acre. This is a maximum density in order to maintain the character of the area, while at the same time it is a minimum density necessary to economically support a public sewer system. Including day use at the state parks, it appears this area could support around 2,500 persons on a peak usage weekend, such as during Chief Joseph Days.

A major consideration in committing the west moraine to limited development was the fact that subdivision has already occurred along the road and a scattering of recreational homes are in existence. In addition, the sewer interceptor from the south end of the lake will be placed along the road thereby allowing eventual service to this area.

Although the topography of the area is not particularly conducive to development nor is linear development particularly desirable, it is possible to continue building along the existing road. This would produce a row of dwellings above and below the road where terrain allows. Development based on the existing subdivision pattern would accommodate over 200 homes or between 700 to 800 persons. The west moraine, unlike the east moraine, contains a great deal of natural foliage. Although development of this scale could not be totally concealed, the abundance of trees would certainly help to soften the visual effect.

The remaining portion of the west moraine, like the east moraine, would be preserved in its natural state. The east moraine is the most critical area to maintain, since any type of development, on the top or on the lake basin side, would not only impair the visual and aesthetic aspects of this formation but could also cause potential hazards. This moraine is composed of glacial debris which will become highly unstable if the soils and grass cover are disturbed by excavation or through road construction. Slippage and erosion would then occur both of which, besides creating an unsightly landscape, could seriously damage the water quality of the lake by adding to its turbidity. Furthermore, the slopes on the east moraine are so severe that development would be extremely difficult and costly. Therefore, the plan recommends that these areas be placed into an open space classification.



RECOMMENDATIONS

In order to facilitate implementation of the land use plan and the water and sewerage plans presented in the following section, it is recommended that the County take the actions listed below.

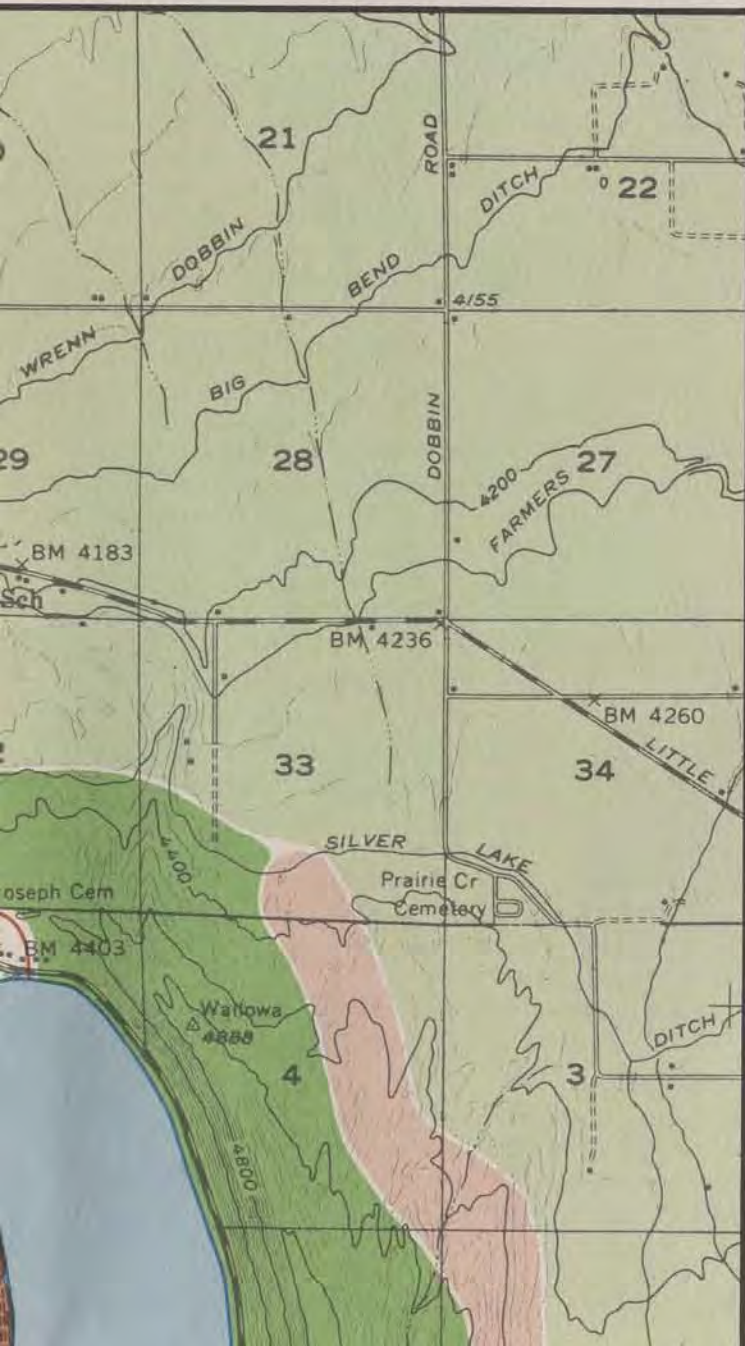
1. The County should adopt this plan as the official land use plan for the Wallowa Lake Basin area.
2. The County should update its zoning ordinance to reflect the plan.
3. The County should establish a service district to facilitate construction, maintenance and management of public water and sewerage facilities in the lake basin area.
4. The County should seek federal assistance to offset costs for the construction of these facilities.
5. The County should retain a competent engineering firm to provide engineering services and construction drawings for these systems.

WATER SUPPLIES AND SANITARY SEWAGE TREATMENT

Since society has come to depend more and more upon adequate water supply to meet daily needs and conveniences, water consumption has more than doubled in the last several years to the point where individual consumption is over 100 gallons per day. Development and distribution of this quantity of water is only one part of the total problem, for once used, the water must be treated before it is returned to the environment. The Wallowa Lake Basin Study Area is unique and deserves unique solutions to these old problems of providing community services.

SERVICE AREA

For planning purposes, the lake basin has been divided into three separate geographic areas as follows:



ADMINISTRATIVE ASPECTS

The administrative aspects of both water and sewer utilities must be handled by specific governmental entities.

In the case of established cities, state law specifically authorizes the construction and operation of these utilities. Without this form of government, special districts must be formed to handle the administrative aspects. Two forms of districts may be considered, sanitary and water districts or a county service district. These must be formed by vote of the people. It is recommended that a study be made to determine the most suitable attributes of each before a decision is made and a vote is held. This must be the first act, for all else depends on the formation of the governmental entity.

PRESENT CONDITIONS

At present, all the commercial and residential facilities in the lake basin are served by a number of small water supply systems which have been generally classified as unsatisfactory by the Public Health Engineering Section of the State Division of Health. This classification is established by the fact that chlorination of the supplies is not practiced, and a number of these supplies are taken directly from unprotected surface sources. In addition, the distribution systems are thought to be inadequate. The systems have relatively little ability to carry fire protection flows, and the sources are inadequate in this regard as well. The Health Division surveys also indicate that some of the systems are old and are in deteriorated condition.

Subsurface sewage disposal serves the commercial and residential development in all three areas. These systems are all individual septic tanks with drain fields which percolate the effluents into the soils. For the most part, these systems are working well with little problem of surfacing effluents or resulting public health nuisance conditions. All sources of information attribute this condition to three basic factors: (1) the seasonal use of most of the facilities in the lake basin, (2) the nature of the soil in the area, and (3) the fact that the seasonal use allows the soil to rest and rejuvenate.

Although no definite problem has been cited, it is generally indicated that there is no guarantee that adding additional loading to the soil, by either more units or changing the nature of the use from seasonal to year-round, would not cause a breakdown of the soil and result in pollution of the lake. Therefore, there has been general interest in providing community sewerage facilities at the earliest possible time.

As indicated, the lake does not show that it is being polluted. Tests have been made by personnel of the Department of Environmental Quality over a period of years. The general conclusion drawn from these test results is that water-based activities, swimming and boating, are as responsible for the occasional indications of contamination as any of the



Area 1 - The North Shore — This is the area between the lake and the City of Joseph. It is approximately 40 acres in size and could ultimately hold about 200 people.

Area 2 - The West Shore — Sparce development in a narrow band along the west moraine comprises planning area No. 2. At the present time, 225 residential lots are plotted here with the potential of 100 more. It is estimated that ultimately as many as 800 people will require community services. It is not, however, anticipated that this will be the most urgent area of service need since this is suited primarily to recreational home development.

Area 3 - The South Shore — This is the area of the most urgent and immediate concern. This area includes all of the developable land on the delta at the south end of Wallowa Lake. It is here that most of the present and future commercial facilities will be located, thus, creating the most concentrated need for adequate water supply and waste disposal facilities. At peak seasonal usage, it is expected that approximately 2,500 people will require facilities in this area.

yet been established.

To summarize, the lake is not generally being polluted by the present land uses. However, growth and development could overtax the ability of the soils to adequately handle the increased effluent loads and could result in an environmental change of the lake, thereby affecting the whole area.

The water supply systems must also be updated to meet current requirements of the State Health Division with immediate action being taken. An overall program is offered herein to provide these communities services.

WATER SUPPLIES PLAN

Several methods of serving the three planning areas with an adequate water supply are available. There was concern that a regional system serving these areas and the City of Joseph should be considered. Preliminary estimates of cost for this regional system have been compared with cost estimates of individual systems which offer the same service but would not be regional in scope. Since the distance between the two main areas of concentrated use is so great, the estimated cost of individual systems is the most favorable. Therefore, this is the recommended program of this report.

The system proposed recommends that Planning Area No. 1 will be served from the improved and upgraded City of Joseph system. This is the most costly means of serving this area but it is minor in the overall program. It will probably be necessary that a pumping station be used to maintain service pressure in the area, since it is higher than the city proper.

Planning Area No. 3 is a prime concern. It is assumed that this will be the area of greatest development in the future as well as being in need of immediate service. It is proposed that the springs located in this area be correctly developed, that a reservoir be built and an area distribution system be constructed to serve Planning Areas No. 2 and 3. Planning Area No. 1 and the City of Joseph will constitute a separate system.

Planning Area No. 2 is expected to be the slowest to develop. It is currently served by a system which extends for a considerable distance along the roadway. The source is near the southerly end of the area, and, although of apparent adequate size, it is in need of being upgraded by providing treatment and the development of storage facilities.

Basic information on spring flow was not available, therefore, it is proposed, should an inadequate supply result from development of these springs, that the source be supplemented by other means such as: (1) development of ground-water supplied by drilling a well, (2) constructing an infiltration gallery in a stream bed, (3) treating water from Wallowa Lake or (4) a combination of these supplemental sources.

The development of the source of water supply should be first based upon simplicity of operation. The springs best fit this requirement. The wells would be the next simplest means with a treatment plant being the least desirable for considerable operation and maintenance would be required. Cost of development is also an important factor and would nearly parallel the simplicity range—the treatment plant being the most costly from both construction and operational cost points of view.

An estimate of the cost of developing a water supply and distribution system serving Planning Areas No. 2 and 3 has been made. These costs are based upon the definite features described and could be changed to some degree in the final design phase. These costs are as follows:

Spring Source Development	\$ 12,000
Well & Pump	21,000
Storage Reservoir (800,000 gal.)	65,000
Transmission & Distribution Mains (16,000 feet)	<u>201,000</u>
Total Construction Costs	\$ 299,000
Administration & Contingencies at 25%	<u>75,000</u>
TOTAL COST	\$374,000

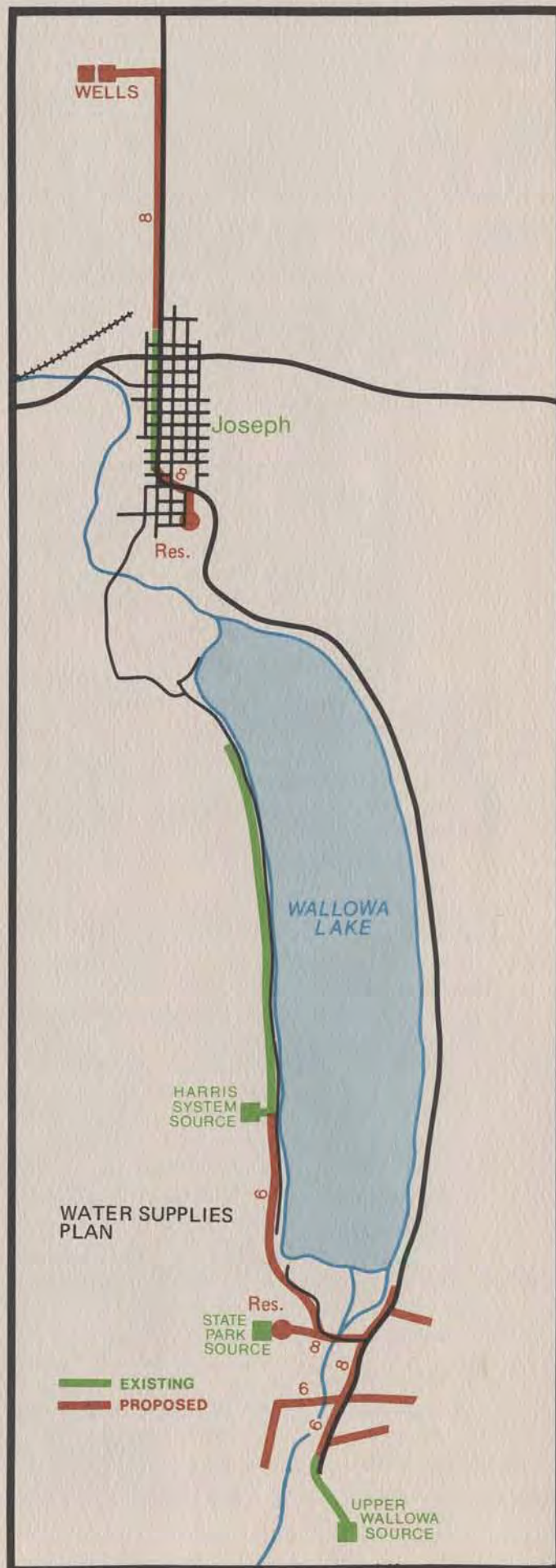
Serving Planning Area No. 1 from the City of Joseph has been estimated as follows:

Distribution System (9,500 ft.)	\$114,000
Booster Pump Station	<u>8,000</u>
Total Construction Cost	\$122,000
Administration & Contingencies at 25%	<u>30,500</u>
TOTAL COST	\$152,500

SEWAGE COLLECTION AND TREATMENT PLAN

Maintaining the present high water quality of Wallowa Lake has been the uppermost concern in the planning of sewerage facilities for the three planning areas. Collection of all the individual waste sources is, of course, required. It has been proposed that this be done in a system of the highest quality. There are two basic reasons for insuring that the system be bottletight. The first is to insure that the collected effluents do not escape into the soils or to the lake, but even more important, it is to insure that excess storm and infiltration waters do not enter the system. The entrance of excess flows not only reduces the sewage-carrying capacity of the system but also results in providing treatment to otherwise uncontaminated water.

Once collected, the flows must be treated before being released back into the environment. All forms of treatment which are considered to be in the realm of economic feasibility result in some effluent residual. In other words,



reasonable. Therefore, with the ecosystems of the lake in mind, treatment and discharge to the lake were not considered.

Other means of handling the collected flows were investigated, but it was determined that space limitations and steepness of slope ruled them out. The one remaining alternative to on-site treatment was pumping the collected sewage out of the basin. Due to the elevation of the surrounding mountains, pumping the flows along the lake was the most feasible solution.

The system recommended will collect all sewage flows generated in Planning Area No. 3 at a common point in that area at a combination equalization basin—pump station. The collected flows would then be pumped along the lake on a constant and continuous basis eliminating flow surges which necessitate enlarging the system designed. A single force main would extend down the west moraine through Planning Area No. 2. The force main would enter a gravity system in the vicinity of Planning Area No. 1, so this area could be served initially. The gravity sewer would terminate in the City of Joseph collection system.

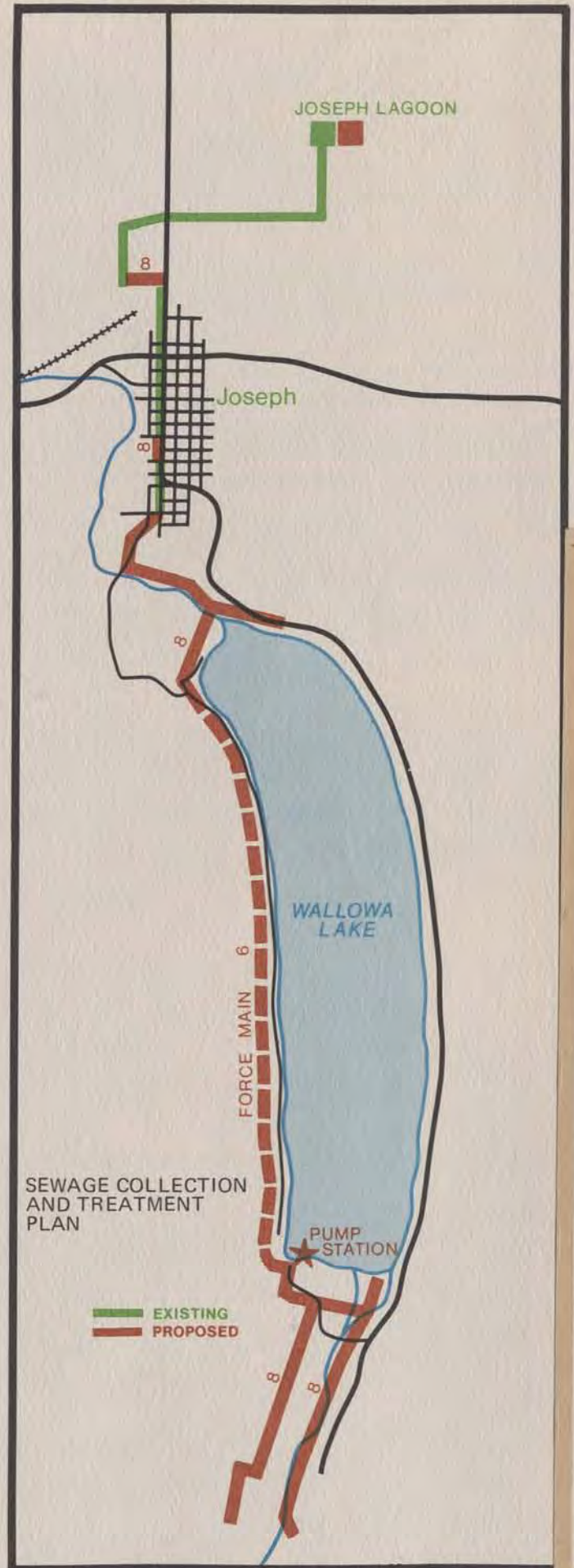
Planning Area No. 2 could be served in the future when growth concentration makes it necessary or if nuisance conditions occur. This could be accomplished by the construction of small pumping stations serving localized areas. These stations would, in turn, pump into the force main.

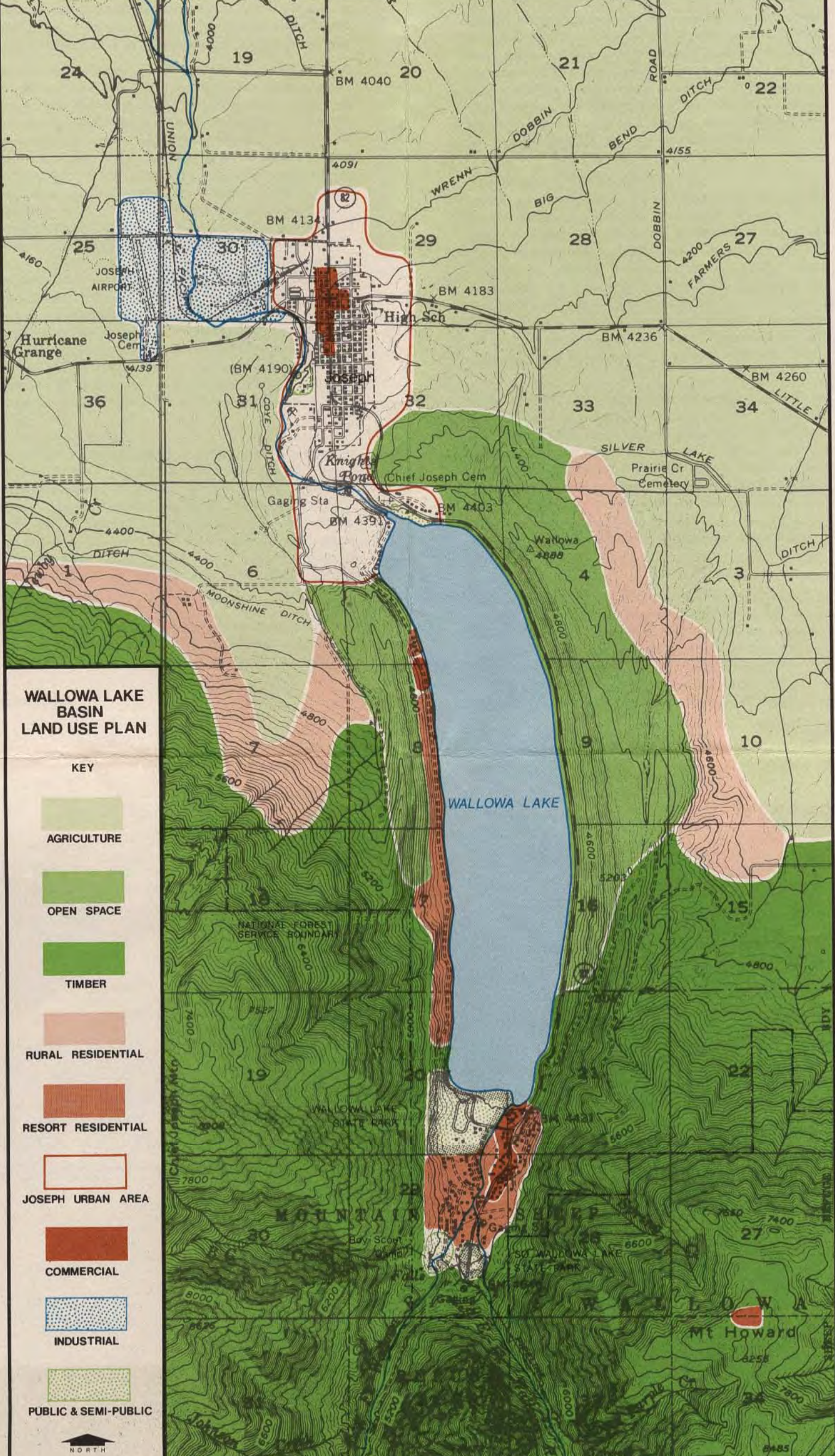
By equalizing the pumping rate over the entire day and excluding extraneous flows, only a small portion of the existing City of Joseph collection system would need replacement. Treatment of the collected wastes will be provided in the expansion of the existing City of Joseph lagoons.

Cost of this system has been estimated as follows:

South Shore Collection System (11,500 feet)	\$161,000
Pump Station—Equalization Basin	82,000
Force Main (22,500 feet)	270,000
North Shore Collection System (9,200 feet)	129,000
Lagoon Expansion	137,000
City System Replacement (750 feet)	<u>10,500</u>
Total Construction Costs	\$ 789,500
Administration & Contingencies at 25%	<u>197,500</u>
TOTAL COST	\$987,000


It must be remembered that these estimates are preliminary and the system configuration could change to some degree in the final design. An example of this is that possibly part of the north shore collection system would be forestalled for a time once the routing of the force main and the gravity system in this area is established.






**WALLOWA LAKE BASIN
LAND USE PLAN**

KEY


 AGRICULTURE

 OPEN SPACE


 TIMBER

 RURAL RESIDENTIAL

 RESORT RESIDENTIAL

 JOSEPH URBAN AREA

 COMMERCIAL

 INDUSTRIAL

 PUBLIC & SEMI-PUBLIC

