1.0 PURPOSE AND NEED

1.1 Purpose

The purpose of the Milltown Hill Project, a 24,143 acre-foot reservoir and pipeline distribution system 19.6 miles long in the Elk Creek subbasin (Umpqua River Basin) of western Oregon (Figure S-1), is to fulfill a portion of the existing and projected needs of urban and rural water users. The project would:

- Provide increased water supplies during the growing season through an irrigation system, to provide a full supply of irrigation water for up to 2,601 acres of arable land in Yoncalla and Scotts Valley, and allow pumping of water directly from Elk Creek to provide a full supply up to an additional 1,163 acres of arable lands along Elk Creek. A supplemental supply would be provided to 897 acres.

- Provide for the storage and distribution of water to the cities of Yoncalla and Drain and the community of Rice Hill, allowing for municipal expansion and industrial diversification.

- Provide a reliable source of water for rural domestic use in the areas served by the pipeline system.

- Provide opportunities to improve fish and wildlife habitat.

- Improve water quality in Elk Creek and Yoncalla Creek.

- Provide new water-related recreational facilities.

- Provide limited flood control, in and near the city of Drain.

1.2 Need

Historically, Douglas County has relied on the forest products industry to be its main economic contributor. Timber receipts account for 70 percent of the County's revenue. In recent decades the forest products industry has been subject to unpredictable markets for its products. This condition results in seasonal and sometimes protracted unemployment, which in turn causes significant losses of revenue for the County. When such conditions exist, the County is unable to provide continuing optimal services to its residents. Douglas County has, for decades, searched for means to diversify its industrial base in the hope of stabilizing its economy. In 1985, the Bureau of Reclamation and the Douglas County

Water Resources Survey initiated the Northern Douglas County Water Resources Study to find solutions to the resource needs in the Elk Creek subbasin.

The primary socio-economic problem in the Elk Creek subbasin is the lack of opportunities for industrial growth and diversification. This problem has been on-going for decades. The area has historically been dependent on one industry, the forest products industry. The privately-owned, old growth timber base supplying the resource for the industry has been almost completely depleted after forty to fifty years of harvesting. Changes in wood processing techniques, competition for government-owned timber, high stumpage and processing costs, and unpredictable markets have forced most processing plants in the Elk Creek subbasin out of business. The future of this industry remains uncertain, especially since recent region-wide controversy has been generated over the future management of old-growth forests and the protection of the Northern spotted owl, a federally designated threatened species.

The tourist industry, an important economic factor in Douglas County, is not a viable income producing alternative in the Elk Creek subbasin. There are no destination resorts to attract tourists and water-related recreational opportunities are not available in the Elk Creek subbasin. There are no federal or state parks.

The economy of the area is not likely to improve unless opportunities are made available for industrial diversification. The Milltown Hill Project presents one opportunity. The key to industrial and economic diversity is the availability of water. Cooperative investigations between Douglas County and the Bureau of Reclamation have found that the area suffers from the lack of year-round supplies of quality water for municipal, industrial and irrigation use. Lack of water has inhibited economic growth in the Elk Creek subbasin. Construction and operation of the Milltown Hill project would store and supply the necessary amounts of water for municipal growth, industrial diversification, and improved agricultural development. The project would improve anadromous fish habitat, water-related recreational activities, and provide some flood control. Water quality would also be improved.

As a result of the findings of these studies, Douglas County applied to the Bureau of Reclamation for a loan under the Small Reclamation Projects Act (SRPA) (P.L. 84-984) to construct and operate the Milltown Hill Project. This action was taken in May, 1991.

A more detailed discussion of area needs follows:

1.2.1 Socio-economic

The problems of seasonal and cyclical unemployment in the Elk Creek subbasin are related to the vagaries of the wood products industry. The decrease in available private timber in the past decade has increased the demand for federal timber. This in turn has created inordinately high prices for timber. Bidders actively bid on timber which may be hauled more than 100 miles to be processed. Local processing plants have not been able to meet the competition. This has resulted in mill closures and the loss of jobs.

The tourism industry in the Elk Creek subbasin is not considered a major job-producing industry since there are no major recreational facilities in the area. Many local residents have moved to Roseburg or Eugene to find employment. Other residents have remained in the area, either commuting to these cities or attempting to find temporary local employment. Unemployment rates remain high. This results in increased social problems with which the County must control. At the same time the demands for local government increase, tax receipts and other county revenues are reduced, thereby limiting government's ability to provide the needed services.

1.2.2 Anadromous Fish

Elk Creek offers little habitat diversity for the production of fish and other aquatic organisms due to the lack of gravels, riffles, and other instream structures. Spawning and rearing habitat for anadromous and resident fish is sparse, especially during low flows. Late summer flows are generally less than 5 cfs and frequently approach 0 cfs, whereas average winter and spring flows are about 800 to 1,000 cfs. The low summer flows and warm climate combine to create warm water temperatures that frequently exceed 75°F in the mainstem.

Stream temperatures throughout Elk Creek subbasin regularly exceed the maximum temperature of 58°F for protecting the eggs an young of cold water fish (such as trout and salmon). The 65 to 70°F maximum that cold water fish can withstand for short periods is also regularly exceeded. Measurements in Elk Creek near Elkton show periodic temperatures near 80°F. The stream needs reduced temperatures to support the spawning and rearing of cold water fish.

Specific areas of need identified within Elk Creek include improved instream habitat, improved riparian habitat, increased instream flows, and lower water temperature.

Elk Creek consists of a bedrock system with many long pools and few riffles. Most of these pools occur in the lower part of

the creek below Drain. They are generally shallow and less than 3 feet in depth. These pools provide the primary fish rearing potential in Elk Creek, but they contain little if any cover such as boulders and woody debris required by young fish. Enhancing the pools for rearing would require placement of additional materials to provide cover.

Spawning habitat requires gravel. The mainstem of Elk Creek lacks significant gravel sources. Some gravel deposits occur along the stream banks and in the small tributary streams. In order to enhance mainstem spawning, measures are needed to trap gravel and disperse it across the bottom of the stream. The stream would also require additional placement of gravel to supplement natural recruitment.

Elk Creek has good riparian habitat and canopy in the upper 1/2 of its length. Several areas between Scotts Valley and Boswell Springs and in Putnam Valley have sparse riparian vegetation. The areas of sparse riparian vegetation appear to have resulted from land use practices, primarily grazing. Insufficient riparian vegetation causes bank erosion, increases stream temperatures, removes a source of biomass to the stream, reduces cover for the fish, and may reduce summer base flow. Those areas with poor riparian vegetation need a combination of plantings and other measures to protect the riparian vegetation. Between 1.5 and 2.0 miles of stream require riparian restoration. Below Drain, Elk Creek widens and riparian canopy is minimal to the mouth.

Streamflows become very low in the summer months, particularly in July, August, and September. Irrigation diversions further reduce these flows. Periods of no streamflow are common. Since low flows occur during the hottest months of the year, water temperatures become elevated. These conditions eliminate rearing habitat. Elk Creek needs an increase in instream flows during summer months to maintain rearing habitat.

In 1974, the State established a right for minimum flows on Elk Creek to help protect instream flows. Annually, these minimum statutory flows are violated 44 percent of the time. In 15 of the 28 years, at least 1 day of zero flow was recorded. There were 33 days of no-flow in 1973.

1.2.3 Wildlife Habitat

Wildlife habitat in the Elk Creek subbasin has been altered by road construction, logging, agriculture, grazing, and residential development. Land use in Shoestring Valley above Walker Creek has caused changes from forest successional stages to grass-pasture. Wildlife habitat needs would involve planting wildlife food plots in pastures and developing snags for cavity nesting species. A continued effort is needed to restore and enhance wildlife habitat.

1.2.4 Ground Water Quality

Information supplied by a study (Geological Survey, 1977) indicates that ground water quality in the Elk Creek subbasin, particularly in the Putnam, Scotts, and Yoncalla Valleys, is not suitable for municipal, industrial, or agricultural uses. This is due to seasonal high nutrient and coliform levels, apparently coming from non-point sources. There is a need to reduce nutrient input into ground water.

1.2.5 Ground Water Availability

Studies by the Geological Survey in 1977 indicate that the ground-water resources in the project area are limited and variable. Yields from existing wells range from about one to a few gallons per minute. The study concludes "because of the low permeability and low yield of the aquifers, there is little potential for large irrigation or municipal ground-water development in the Drain - Yoncalla - Rice Hill area. Additional municipal - irrigation water will have to come from new surface storage" (Bureau of Reclamation, 1991). There is a need for surface supplies to augment ground water supplies.

1.2.6 Surface Water Quality

In general, the surface water quality in Elk Creek subbasin is good. Total dissolved solids run well below the recommended maximum for municipal use of 500 milligrams per liter (mg/l). Most constituents examined in standard tests such as calcium, sodium, potassium, carbonate, sulfate, and chloride also are acceptable.

Some county water supplies do not meet use-criteria at various times and places. In particular, water samples taken at several locations in the subbasin exhibit problems with color, turbidity, temperature, fecal coliforms, dissolved oxygen, and various trace metals. Both aquatic life and esthetics are threatened in the lower 27 miles of Elk Creek because of pH and nutrient levels (Department of Environmental Quality, 1990). Contact recreation and aquatic life uses in this reach are not supported because of fecal coliforms and dissolved oxygen levels as well as low summer flows. The report states that suspected causes are agriculture (return flows), municipal point sources (sewage effluent), and nonpoint sources (septic tanks and drain field systems). The implication is that the problem is a seasonal one that occurs during low summer flows. There is a need to determine the causes of dissolved oxygen and fecal coliform problems.

The Department of Environmental Quality (DEQ) cited effluent from the Cities of Drain and Yoncalla as possible causes of high coliform and nutrient levels in Elk Creek in its 1988, 305b report.

In response to a mandate from DEQ, some cities in Douglas County are being required to enter into long-term contracts with the County to purchase storage water to augment river flows for improving effluent assimilation. Douglas County has published augmentation requirements to rectify flow deficiencies from May through October in the Elk Creek subbasin.

Elk Creek has high turbidity and color levels. Color affects the stream's esthetic appeal while turbidity can increase treatment costs and limit municipal and industrial use. Turbidity can be caused by streambank erosion, stream bottom erosion, and land management practices. High turbidity and color levels are greatest during high runoff months and are most likely associated with deciduous leaf fall and streambank erosion. Elk Creek subbasin needs better land management to help reduce sediment transport, color, and turbidity levels.

The principal problem with water temperature is the effect it has on cold water fish, such as salmon and steelhead. Salmon eggs are extremely sensitive to temperature. Eggs are harmed when temperatures exceed 56 °F. Mortality begins at 57.5 °F. Young fish are able to tolerate temperatures as high as 65 to 70 °F for short periods of time. Stream temperatures measured in Elk Creek near river miles 42.2 and 25 indicate that temperatures at these sites regularly exceed these temperatures. Spot measurements in Elk Creek near Elkton show periodic temperatures exceeding 80 °F. Data indicates that the timing of critical temperatures in Elk Creek occur as noted below:

- Near Elkhead ------ June through early September.
- Near Drain ------ late May through early October.
- Near Elkton ------ May through October.

Elk Creek needs lower water temperatures during these critical times. Low flows and sparse riparian canopy in certain stream reaches contribute to the temperature problem. High temperatures, in turn, contribute to dissolved oxygen problems. The stream needs 1.5 to 2.0 miles of improved riparian vegetation and augmented summer flows to help reduce temperature.

Water samples taken near river mile 42.2 (approximately 2.8 miles upstream from the damsite and 0.5 miles downstream from the abandoned Elkhead mercury mines) indicate elevated concentrations of cadmium, chromium, copper, lead, mercury, and zinc. However, these concentrations are within Federal and State water quality standards for safe drinking water.

The Elkhead mercury mine operated near the proposed reservoir. A survey of the abandoned mercury mine, tailings, and water sources in and near the mine indicates potential contamination. The potential for contamination from the Elkhead Mercury Mine site needs to be monitored.

1.2.7 Municipal Water

The Cities of Drain and Yoncalla have attempted to augment their water supplies by constructing small storage reservoirs to help meet municipal demands during the dry summer months. The city of Drain has constructed a 290 acre-foot reservoir on Billy Creek, which serves the City of Drain. Yoncalla has as offstream, 100-acre foot storage reservoir, which is filled by pumping water from Adams Creek. The reservoir helps meet peak summer demands. The subbasin has no other significant water storage facilities.

The two communities have surface water rights for municipal water. The City of Drain has a 1909 priority right for 2 cfs and a 1912 priority right for an additional 2 cfs from Bear Creek (a tributary of Billy Creek). It also has a 1971 storage right for 1,000 acre-feet on Billy Creek. These rights are adequate to meet present needs, however the flow yields on Bear Creek are not adequate, and the existing reservoir on Billy Creek cannot meet the municipal demands of the future.

Yoncalla has a 1923 priority right for 1.5 cfs from West Fork Wilson Creek, Wilson Creek, and Adams Creek, and a 1940 priority right for 0.23 cfs from Adams Creek. It also has a 1979 storage right for 111.5 acre-feet. The existing 100-acre foot reservoir is located offstream in the Yoncalla Valley. The reservoir is filled by pumping water from Adams Creek. The water rights appear to be adequate, but the opportunity to develop them is limited. Adams Creek has recorded zero flows at times which makes the supplies unreliable. Yoncalla's reservoir is shallow, suffering from algae growth and high temperatures, which adversely affects the water's palatability.

There is a need to develop a source of water for Drain, Rice Hill and Yoncalla which is both reliable and adequate for present and future demands. Based on population projections, the cities of Drain, Rice Hill and Yoncalla will need 1,405 acre-feet of water to meet the needs through the year 2030.

1.2.8 Rural Domestic Water

Rural domestic water is classified as water obtained from individual sources, not from any water vending entity. Most often, ground water is obtained from individual private wells. Occasionally, a larger well or series of wells benefit a group of residents.

Surface waters are not generally diverted for rural domestic use because of the cost of potable treatment. The rural population growth in Elk Creek subbasin has recently outpaced the growth in the two cities. This indicates a trend for the need of a central water supply to serve rural domestic needs in the future. The

County has estimated rural demand will increase from 822 acre-feet in 1980 to 1,164 acre-feet in 2030.

1.2.9 Industrial Water

Industrial water use from Elk Creek is limited to two rights for log storage ponds, totaling 1.02 cfs. Future industrial use in the Elk Creek subbasin is expected to be limited to sand and gravel operations. This use would require about 25 acre-feet per month from May through October for a total of 150 acre-feet annually.

At the present time, there does not appear to be a reliable source of water available for industry. Costs associated with the treatment of municipal water are prohibitive for most industrial applications. A new source of water is needed to provide industrial opportunities and diversification of the economy.

1.2.10 Irrigation

The hilly topography in the Elk Creek subbasin supports lush unirrigated pasture part of the year, which contributes to the predominance of sheep and livestock production. However, little land is suitable for the production of crops that require annual tillage. Orchards and some specialty crops such as wine grapes have been produced in the past, but distance to markets and processing costs are excessive for the volume produced. Local production has not been adequate to attract processing facilities or markets.

Agricultural areas in the subbasin receive approximately 40 inches of rain per year, but it is concentrated in the months of October through April. The area experiences very dry conditions July through September, resulting in low streamflows, thereby restricting the water available to irrigate crops at critical growth periods. There is no irrigation storage facility to provide water during these dry summer months. As many as 7,377 acres of potentially irrigable land has been identified in the subbasin. Irrigation of this land could help the County achieve its goal to diversify and strengthen the local economy. The maximum legal water duty in Douglas County is 2.5 acre-feet per acre per year. This indicates that the subbasin needs 18,450 acre-feet per year to develop its land base. Irrigating less than 7,377 acres of land or using less than 2.5 acre-feet of water per acre would reduce the annual water need for irrigation. Development of this land could also require development of drains to avoid high water table problems.

Because the State established minimum flow requirements on Elk Creek in 1974, water rights established after that time do not receive a full supply in most years. Further, commercial

agriculture is not protected in times of drought or extreme low flow, and many pre-1974 rights are also turned off early in many years.

The District 15 Watermaster has indicated that water rights established before 1950 generally have a full supply of water each year. Priority rights established between 1950 and 1974 normally begin to be curtailed around the end of July in most years. Diversions with priorities after 1974 are normally cut off about July 1. Applying this schedule to existing irrigated acreage, between 350 and 680 acres receive a full supply; about 740 acres get water until July 31; and 73 acres receive water until June 30 in most years.

Junior water right holders on Elk Creek frequently lose their water supply in the latter part of the summer. These junior rights need a supplementary supply in order to fully utilize the land's potential. The current uncertain water supply has prevented farmers from optimizing the productivity of their lands and has prevented the County from realizing the full economic potential of its land resources.

Approximately 897 acres of land need supplemental water service. The average annual water needed to fully supply these lands is 1 acre-foot per acre, or an average annual water need of 897 acre-feet.

1.2.11 Outdoor Recreation

Current outdoor recreation opportunities in the Elk Creek subbasin are relatively few. There are no destination resorts in the area, due to the lack of large County, State or Federal recreation areas, and the lack of water-oriented recreation facilities. Most of the land is privately owned. This precludes the development of any large scale public outdoor recreation activities.

The development of a large water-oriented facility in the subbasin would partially fill the current void of recreation opportunities, thereby attracting local and regional visitors. Increased recreational opportunities would result in increasing the area's share of the County's tourist industry. There is a need for water-oriented recreation facilities.

1.2.12 Flood Control

Elk Creek has no flood control structures. High winter streamflows damage both urban and rural property. Property damage caused by flooding tends to be concentrated in the City of Drain where industrial, commercial, public, and residential developments

are located on the flood plains of Elk Creek and Pass Creek.

Pass Creek enters Elk Creek within the boundaries of the City of Drain. During high flow periods, backflows from Elk Creek enter the lower reaches of Pass Creek and exacerbate flood damages near their confluence. Damages to agricultural lands and woodlots occur in the rural areas both upstream and downstream of Drain. Bridges in Drain and in the outlying areas are subject to damage from high floodflows. The largest flood of record, estimated to be greater than a 50-year recurrence interval flood, occurred on February 10, 1961, when a maximum instantaneous flow of 19,000 cfs was recorded on Elk Creek downstream of its confluence with Yoncalla Creek. Studies performed by the County and the Corps of Engineers estimated flood damages that are anticipated with each size flood. The results of these studies indicate the average annual flood damage in the subbasin approximates $205,000 (U.S. Army Corps of Engineers, 1988).

Flood control in Elk Creek would require keeping flood flows in channel and out of flood plains, or by developing an upstream storage facility capable of storing water during periods of peak runoff. Land use changes can also reduce flood damage.

1.2.13 Wetlands

Wetlands habitat in the potentially irrigable areas have been greatly degraded by land practices. Historically, there were agricultural lands which contained high value seasonal wetlands. Much of this land has lost its wetland characteristics due to farming and draining operations. However, some lands still meet the definition of jurisdictional wetlands by soil, hydrologic, and vegetation criteria. These lands are scattered through Scotts and Yoncalla Valleys and along Elk Creek and its tributaries. These remaining wetlands need protection. Measures should be taken to protect wetlands where possible.

1.3 Summary

Problems in the Elk Creek subbasin relate to lack of adequate summer flows. This is graphically shown in Figure 1-1. Historic flows are low; demands exceeded availability during summer months in 1980 and the trend of increased demand will continue. The estimated shortage of water under current conditions is 6,271 acre-feet. The estimated shortage of water will continue to increase and by year 2030 will be 27,000 acre-feet. The shortage has the following effects:

- Whenever water users cannot receive the amount of water they need, land productivity suffers, local economy is weakened, and water users are less likely to make investments that would enhance the economic value of their land.

- Fishery resources suffer when users deplete Elk Creek of water to the point that fish rearing areas dry up or become stagnant. The long-term effect of this is decreased commercial and sport fishing in the ocean and in the Umpqua River Basin.

- The depleted state of Elk Creek during the peak demand period in the summer severely restricts economic development in the subbasin. Since an alternative ground-water resource is not available for economic growth, the lack of a surface water resource means that growth is not possible.

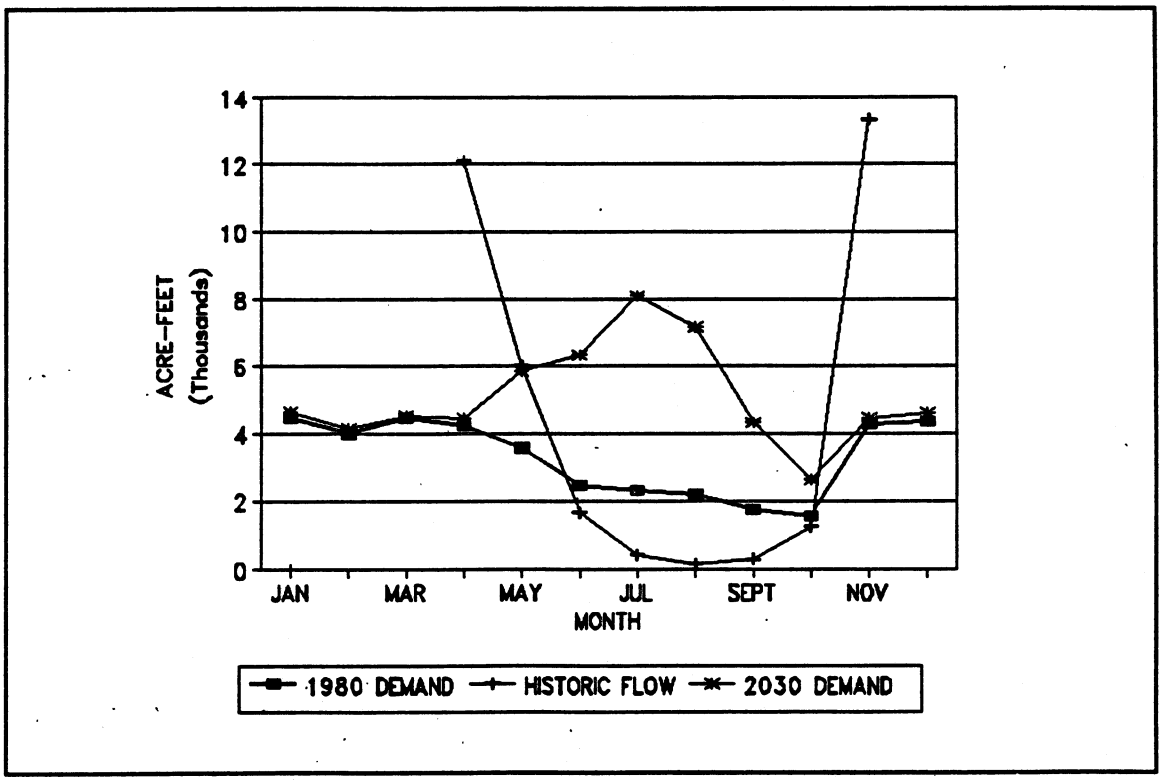

Figure 1-1. Comparison of Historic Flow with 1980 and 2030 Demands on Elk Creek (Bureau of Reclamation, 1991).