SOUTHERN WILLAMETTE VALLEY MUNICIPAL WATER PROVIDERS (SWMWP)

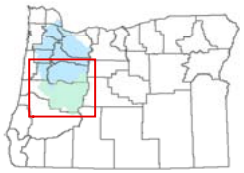
FINAL REPORT

Oregon Water Supply & Conservation Initiative (OWSCI)

November 2008

GSI Water Solutions, Inc.

Southern Willamette Valley Project Area



Stream
UGB
Lake/Reservoir
County
Southern Willamette Basin
Willamette Basin

0 3.75 7.5 15 Miles

N

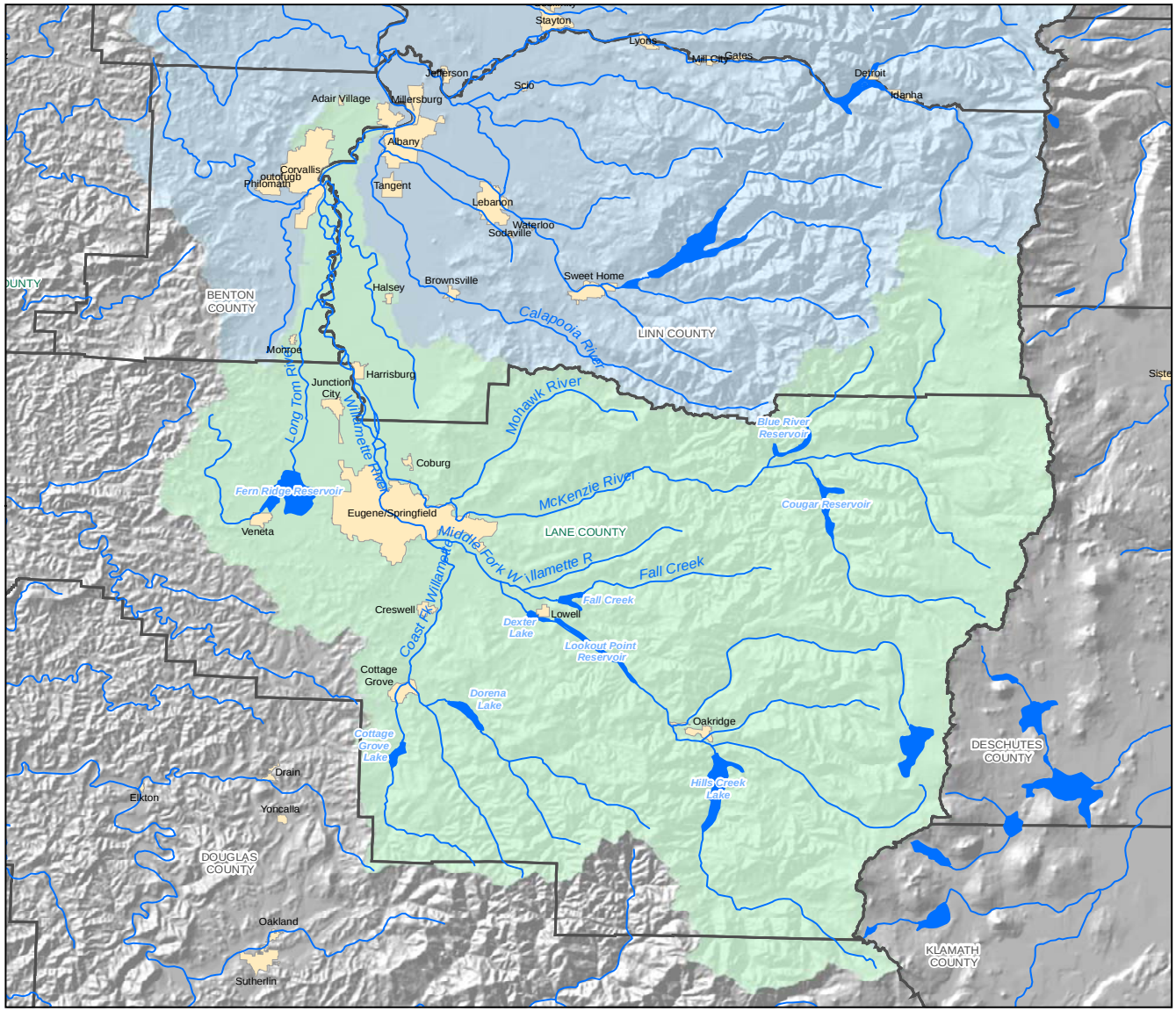


TABLE OF CONTENTS

SOUTHERN WILLAMETTE VALLEY MUNICIPAL WATER PROVIDERS (SWMWP) FINAL REPORT

PREFACE
OVERVIEW
EXECUTIVE SUMMARY

REPORT

Section 1. Introduction

Section 2. Municipal Water Demand in the Southern Willamette Basin

Section 3. Overview of the Willamette basin Project

Section 4. Impediments to Obtaining M & I Water from the Willamette basin Project

Section 5. Summary and Recommendations

APPENDIX 1
APPENDIX 2
APPENDIX 3

PREFACE

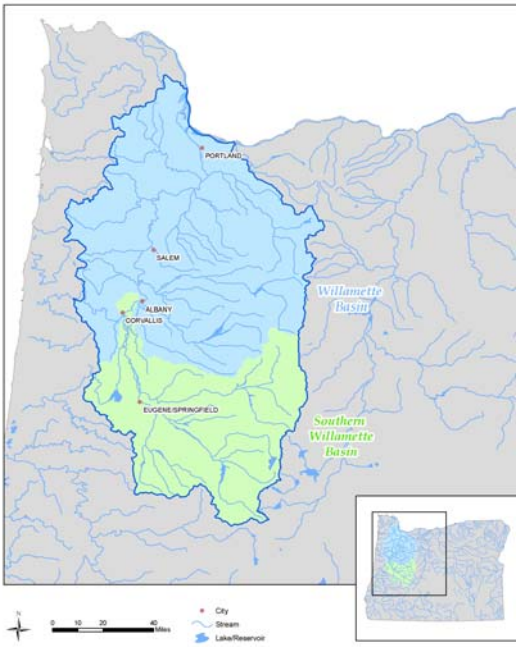
Preface

This Final Project Report contains a high-level project overview (called Our Oregon Water Story), a Technical Executive summary, and a Technical Report. For the uniformed readers, Our Oregon Water Story is intended to give a project overview and context for the Technical Report from the perspective and point of view of the Municipal Water Providers of the southern Willamette Basin. For the informed audiences, the Technical Executive Summary and Technical Report provide the documentation of the scope of work associated with the grant application.

OVERVIEW

OUR OREGON WATER STORY

The **WILLAMETTE BASIN** is the largest river basin encompassed within Oregon and contains approximately 70 percent of the population of our state. It also contains productive agricultural land and supports significant aquatic habitat for anadromous fish populations. The Willamette Basin is home to 16 of the largest 20 incorporated cities in the state.



THIS OREGON WATER STORY BEGINS HERE. Approximately 85 percent of the population in the Willamette basin is supported by public water systems. Public water systems supply safe, reliable water supply to communities to meet the basic needs for human survival, provide fire protection and furnish water for business and industrial development activities. The ability of these public water systems to meet the growing water supply requirements of our communities is critical to the short-term and long-term economic viability of our state.

HOW WE OBTAIN ACCESS TO WATERS OF THE STATE. Public water systems apply for water rights from the State to meet the current and increased future needs of our communities. Once these water rights are approved, we build expensive long-term infrastructure to extract, treat, and deliver the water to homes and businesses. The monetary burden of this work is shouldered by our customers, the citizens of Oregon. Some municipalities have been providing water since before the Oregon Water Code was adopted in 1909.

WATER POLICIES OF THE STATE. Before the Oregon Water Resources Department (OWRD) will issue a new water right, it must determine that water is available for the proposed use and that the use is allowed under its rules called "basin programs," which are adopted by the Oregon Water Resources Commission (OWC). In the Willamette Basin, water is generally not available for new municipal uses and restrictive basin program rules direct municipal water providers to the federal storage projects for additional water supply. Unfortunately, the OWC has left many municipal water providers without ways to secure new water supplies to support Oregon's economic development.

Municipal water providers of the Willamette Basin have been left without options to secure water supply and support Oregon's economic development.

CHALLENGES. The Willamette Basin is perceived to be "water rich" as compared to other areas of the state. The basin has, however, experienced major changes in the management of its water resources. One of the biggest changes came from the development of the Willamette Basin Project, which is

comprised of 13 reservoirs that provide flood control storage and can store 1,640,000 acre-feet of water annually for irrigation.

To date, it appears that stored water has been used for every Congressionally-authorized purpose except for water supply.

MUNICIPAL ACCESS TO FEDERAL STORAGE. Our project explored the issues associated with obtaining water from federal storage projects in the southern Willamette Basin in order to meet municipal and industrial (M&I) water supply and municipal flow augmentation needs. From this work, the primary impediments to the use of stored water have been identified as the limitations in the State of Oregon water rights issued for the projects, the anticipated pricing formula for the stored water, and the potential necessity of identifying an entity to assume the role of contracting authority.

Any actions associated with the short-term and long-term allocations of stored water must include the small but important municipal water demands.

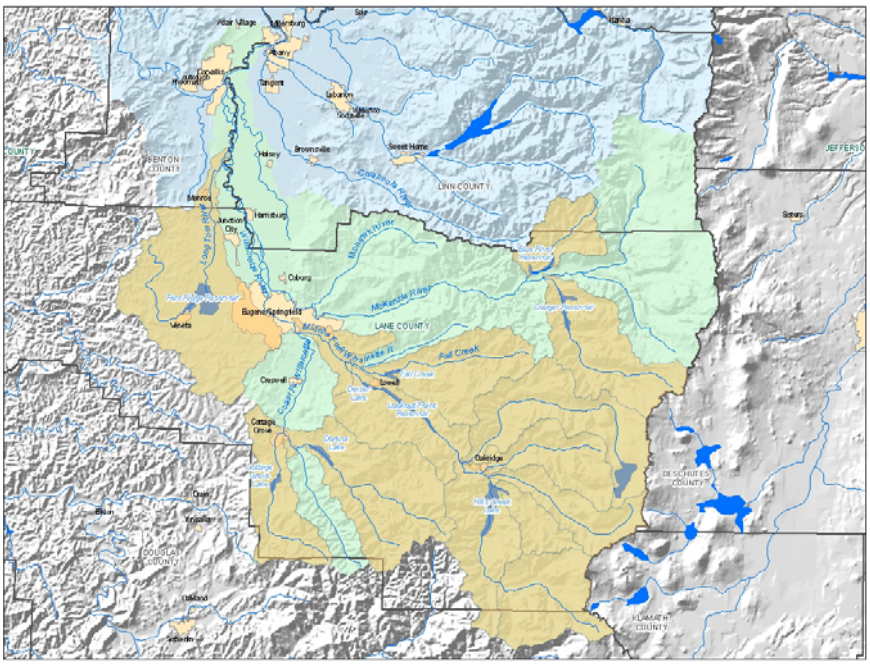
- State water rights only allow storage of water in the Willamette Basin Project for irrigation purposes.
- The cost of water for M&I use under current federal policy would be approximately $1500 per acre-foot. In comparison, the current cost for irrigation water is approximately $10 per acre-foot. This M&I cost would roughly quadruple the current price for municipal water, and would be akin to the cost of gasoline increasing from $3 per gallon to over $14 per gallon.
- The U.S. Army Corps of Engineers (USACE), which manages the Willamette Basin Project and would issue any M&I contracts, has indicated that it cannot efficiently administer numerous contracts.

IMPLICATIONS OF NO ACTION. The 1950 Flood Control Act authorized the Willamette Basin Project for flood control and multiple uses of the stored water, including water supply. In the 58 years since that time, these multiple purposes have not been equitably served, since municipalities have not had access to the stored water. The implications of no action today will result in multiple negative consequences. Stored water cannot be protected instream to protect listed fish species and no stored water will be available to meet the growing needs of our communities. Furthermore, municipalities will be forced to either construct additional, costly storage projects in the basin or press for changes to the Willamette Basin program rules to allow use of surface waters for municipal purposes.

The state and federal agencies should take necessary actions so that municipal water use is no longer the only authorized purpose of the Willamette Basin Project not receiving water.

WORKING TOWARD A STATE WATER PLAN. The state recognizes a need to plan Oregon's water future and is currently working towards its first state-wide water plan. It is anticipated that this plan will involve development of new storage projects and water conservation initiatives. The Willamette Basin Project is already constructed and could serve as an example of how to manage large storage facilities for multiple purposes.

THIS IS OUR OREGON WATER STORY. In the southern Willamette Basin, federal storage projects control water flows in close to 70 percent of the total watershed area, resulting in over 1,000,000 acre-feet of water stored annually. Municipal water needs within this same area are estimated to be 500 to 1,000 acre-feet annually in the short term. In the long term (year 2050), M&I water needs in this portion of the basin are estimated to be 12,000 to 31,000 acre-feet annually. This maximum estimated demand is approximately 3 percent of the water stored in the southern Willamette Basin federal reservoirs. Currently, irrigation water users contract for 41,877 acre feet in the southern Willamette Basin, substantially less than the over 1,000,000 acre-feet held for this purpose under state water right certificates for the federal reservoirs in this area.



We deliver the basic elements required for human survival to your tap.

When the Willamette Basin Project was authorized, it was intended to be an important source for municipal water supply. This perspective was reaffirmed when the OWC adopted the Willamette Basin program rules in 1992, which allowed municipalities to only use stored water in many of the basin's surface water sources. Federal policies and actions, however, have precluded municipalities from obtaining access to this water. In the centennial year of the Oregon Water Code, we should recognized the inherent value of the Willamette Basin Project to restore stream flows, reverse over allocation, maintain our commitment to the irrigation community and provide a small, but very important, amount of water for municipal water supply.

The municipal water providers of the southern Willamette Basin and beyond look forward to your support and collaboration on this critical water supply challenge.

EXECUTIVE SUMMARY

Executive Summary

Introduction

The Southern Willamette Valley Municipal Water Providers (SWMWP) conducted a regional water supply planning project, which was funded by a grant from the Oregon Water Resources Department's (OWRD) Oregon Water Supply and Conservation Initiative. This project explored the issues associated with obtaining water from federal storage projects in the southern Willamette Basin to meet municipal and industrial (M&I) water supply and municipal flow augmentation needs. As recognized in previously completed policy and technical work by both state and federal agencies, there is a broad range of competing demands for the water stored in the Willamette Basin projects. However, any actions associated with the short-term and long-term allocations of stored water must include the small, but important, municipal water demands.

The federal storage projects in the Willamette Basin consist of 13 reservoirs that store 1.64 million acre-feet of water for later use (conservation storage). Nine of these reservoirs are in the southern Willamette Basin. The reservoirs are managed and operated by the U.S. Army Corps of Engineers (USACE). The U.S. Bureau of Reclamation (USBOR) issues contracts for storage space for water to be used for irrigation.

The Flood Control Act of 1950 authorized the USACE to construct and operate the Willamette Basin Project for the purposes described in House Document 531. The document describes those uses as flood control, and the release of stored water for "navigation, for generation of hydroelectric power and for the several conservation uses—namely, irrigation; potable water supply; and reduction of stream pollution in the interests of public health, fish conservation and public recreation." To date, it appears that stored water has been used for every authorized purpose <u>except for water supply</u>.

Municipal Water Demands

Municipalities are struggling to meet the existing demands and to plan for future demands by fully developing their existing water rights. New municipal water rights are not generally an option for numerous reasons, including water availability and restrictive rules and polices adopted by the Oregon Water Resources Commission (OWC) that direct water providers to the federal storage projects. Unfortunately, the OWC has left the SWMWP without options for ways to secure water supply and support Oregon's economic development. To meet their current and future water demands, municipalities need access to a small portion of the 1.64 million acre-feet of water stored in the Willamette Basin Project for both direct supply and for flow augmentation (mitigation) to protect surface water quality and quantity. The seven municipalities participating in this study have calculated combined municipal water needs estimated as follows:

Short Term:

- 500 to 1,000 acre-feet annually for mitigation purposes
- Equals 0.03 percent to 0.06 percent of the 1.64 million acre-feet in the Willamette Basin Project

Year 2025:

- 3,500 to 18,500 acre-feet annually
- Equals 0.2 percent to 1.1 percent of the 1.64 million acre-feet in the Willamette Basin Project

Year 2050:

- 12,000 to 31,000 acre-feet annually
- Equals 0.7 percent to 1.9 percent of the 1.64 million acre-feet in the Willamette Basin Project

Impediments to Use of Water Stored in the Willamette Basin Project

The primary impediments to the use of stored water from the Willamette Basin projects have been identified as the limitations in the State of Oregon water rights issued for the projects, the anticipated pricing formula for M&I water, and the necessity of identifying an entity to assume the role of contracting authority.

State of Oregon Water Rights

Despite the multiple purposes for which the reservoir project was authorized by Congress in 1950, four years later (in 1954), the USBOR initiated the water right application process that resulted in State of Oregon issuing water right certificates for the entire 1.64 million acre-feet of storage for irrigation use only. Consequently, OWRD currently cannot issue water rights for this stored water for any purposes other than irrigation.

Price for M&I Water

The USACE has not allocated storage in the Willamette Basin Project reservoirs to particular uses. According to the USACE, the construction costs have, however, been allocated for each reservoir. None of the costs of construction was allocated to M&I use. A percentage of the total cost for construction for each reservoir is allocated among the following uses:

- Hydropower
- Navigation
- Flood control
- Irrigation
- Low flow augmentation

According to its policies, the USACE would have to reallocate the storage to issue contracts for M&I use. USACE policies also indicate that the cost of contracts following a reallocation are the

higher of the benefits or revenues foregone, the replacement cost, or the updated cost of storage in the federal project. The cost is usually the updated cost of storage, which in 1999 would have been approximately $1,508 per acre-foot. In comparison, Eugene Water and Electric Board provides water to its customers at a cost of approximately $400 per acre-foot. In further comparison, USACE's cost for an allocated use in 1999 dollars would be approximately $189 per acre-foot, and USBOR contracts for irrigation are approximately $10 per acre-foot.

Contracting Authority

The USACE appears to be the appropriate entity to issue contracts for uses other than irrigation from the Willamette Basin Project. According to a USACE study, the USACE district office could process agreements directly with private users. While this may be feasible for a few users, the district office previously indicated that it is not administratively able to efficiently process a large number of requests for small amounts of M&I water. If there is a demand for numerous contracts, it may be possible for the State of Oregon, in its legislatively mandated role to develop a coordinated water resources program, to act as an agent for the entities seeking contracts with the USACE. The USACE previously issued contracts for reallocated water at the original cost of storage based on such an agreement with the State of Kansas.

Recommendations

Based on an evaluation of the issues outlined above, the SWMWP recommends the following approaches for the state and federal agencies to move forward toward resolving the impediments to municipalities gaining access to small quantities of stored water to meet their short-term and long-term municipal water demands.

Pilot Project - Short-term municipal access to water for mitigation purposes

- USACE files a limited license application with OWRD for storage of 1,000 acre-feet of water in Project reservoirs for a five-year period. The application identifies the uses of stored water to be all of the authorized uses for the reservoirs.

- USACE concludes that it can issue a contract to a municipality for flow augmentation purposes to be used for mitigation purposes, based on the authorized purposes for that reservoir and the purposes for which costs were allocated for that reservoir.

- USACE concludes that the cost for a flow augmentation contract is the original cost of storage plus the operation and maintenance expenses, repair replacement, rehabilitation and reconstruction (OMRR&R), which equates to approximately $189 per acre-foot.

- Alternatively, USACE issues short-term surplus water contracts for mitigation purposes. USACE would need to clarify the cost for such contracts.

- USACE concludes that it can efficiently administer up to five contracts for this stored water.

- OWRD continues to provide a leadership role to encourage full participation by all of the parties, and to move the second phase of this process forward.

- USACE determines if the cost allocation for the original construction costs serves as the storage allocation for the project, which would require a reallocation to have M&I included as an allocated purpose.

Long-Term

- USACE follows the procedure its staff has described for transferring the existing storage certificates. Under this process, USACE requests that the USBOR file an application to modify (transfer) its State of Oregon water rights to include all of the authorized purposes for the Willamette Basin Project reservoirs. USACE and USBOR jointly hold the new water right.

- USACE determines that allocation of the storage in the Willamette Basin Project has not occurred, and either issues contract for uncommitted storage or allocates the storage to include all of the authorized uses, including M&I. If USACE fails to obtain authorization for this approach, it could reallocate the storage to include all of the authorized uses.

- If USACE determines that it cannot efficiently manage the number of contracts requested to meet municipal water demands, or if USACE concludes that contracts will be priced on the basis of the current construction costs, OWRD confirms that it has the authority to enter into an agreement, similar to the Kansas memorandum of understanding (MOU), with the USACE, or actively pursues the necessary legislative changes to obtain this authorization.

- OWRD and USACE enter into an agreement under which OWRD could administer the contracts for M&I water, as necessary.

- In the event reallocation is necessary, USACE bases the cost of M&I water on the original cost of construction (approximately $189 per acre foot), as in the Kansas MOU.

- Municipalities request contracts from the USACE through the OWRD and obtain water rights to use the stored water for municipal purposes.

- The State of Oregon continues to be engaged with this process. If municipalities fail to obtain access to federal stored water at an equitable cost and with the requisite level of certainty, the OWC reviews and modifies its policies and rules that currently direct municipalities to stored water as their only potential new water source.

Conclusion

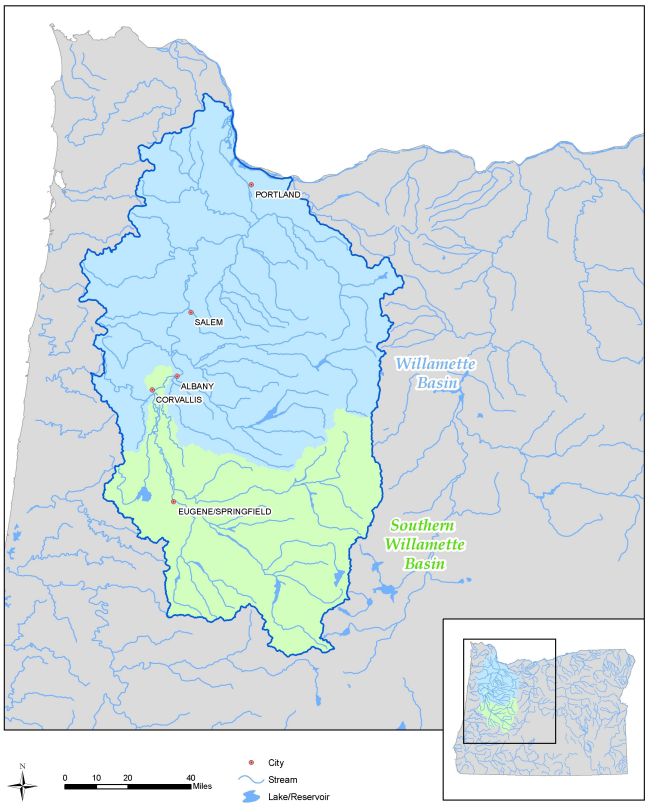
The state and federal agencies should take the necessary actions so that municipal water use is no longer the only authorized purpose of the Willamette Basin project not receiving water.

REPORT

Section 1. Introduction

The Southern Willamette Valley Municipal Water Providers (SWMWP) conducted a regional water supply planning project, which was funded by a grant from the Oregon Water Resources Department's (OWRD) Oregon Water Supply and Conservation Initiative. Under the grant, the SWMWP developed this report outlining the short-term and long-term issues associated with obtaining water from federal storage projects in the southern Willamette Basin to meet municipal and industrial (M&I) water supply and municipal flow augmentation needs. *(For purposes of this report, references to municipal water demands include the need for water for flow augmentation, unless stated otherwise.)* The primary goal of this project was to develop a report that explores whether a path exists for obtaining water from federal storage projects to meet municipal water demands. The project considered issues associated with obtaining water stored in federal reservoirs in the southern Willamette Basin to identify opportunities and impediments for use of federally stored water to meet municipal demands. The second goal of this project was to develop information that could be used to assist the U.S. Army Corps of Engineers (USACE), OWRD, U.S. Bureau of Reclamation (USBOR), and other stakeholders in decisions that address future water supply needs in the southern Willamette Basin as they relate to federal reservoirs. Figure 1-1 shows the southern Willamette Basin in green.

Figure 1-1. Overview of Project Location



Of the 14 urban cities in the southern Willamette Basin, the following seven cities are active participants in exploring the opportunity to use water from federal storage for municipal use: Monroe, Veneta, Junction City, Corvallis, Eugene, Springfield, and Creswell. The Eugene Water & Electric Board (EWEB) was the lead organization acting for the SWMWP.

Throughout this process, SWMWP worked cooperatively with staff from the USACE, USBOR and OWRD to compile and evaluate existing information, and to frame additional questions and issues that need to be resolved. These state and federal agency representatives also reviewed and commented on this report. Further, the SWMWP held two public workshops in Eugene to describe the project to the public and obtain public input. During the first workshop, on June 10, 2008, an overview of the work identified in this project was presented to the public. During the second workshop, on October 21, 2008, SWMWP provided a review of the findings of the project and sought additional input. Twelve citizens participated in these workshops and represented municipal water provider customers, watershed council members, farming interests, or advocacy groups for the resource.

This regional water supply planning project was prompted by the concern that many of the communities in the southern Willamette Basin will need to obtain additional water supplies to meet planned growth during the next 50 years. New municipal water supplies in the southern Willamette Basin are generally not available on a year-round basis. Further, OWRD administrative rules, as well as water quality and fish resource concerns make it increasingly difficult for municipalities to secure sufficient water supplies to meet projected future water demands. Consequently, the SWMWP views water stored in existing federal storage projects as a potential means to meet future water demands, including mitigation that may be needed to exercise existing water rights.

As recognized in previously completed policy and technical work by both state and federal agencies, there is a broad range of competing demands for water stored in the Willamette Basin Project. These demands include fish needs (most recently articulated in a biological opinion [BiOp] for the Willamette Basin Project), recreation needs (both instream and in-reservoir), and irrigation needs. However, any discussion about the short-term and long-term allocations of stored water must include the small, but important, municipal water demands.

The following sections contain analyses of the short-term and long-term municipal demand for stored water, the current status of the Willamette Basin Project, and the major impediments to obtaining federally stored water for meeting municipal demands, and include recommendations for actions to address these impediments.

Section 2. Municipal Water Demand in the Southern Willamette Basin

2.1 Introduction

The communities in the southern Willamette Basin have numerous water needs. As their populations grow, communities must provide an increased supply of municipal water. In addition, they must secure water source redundancy to ensure they can provide their customers with a safe and reliable water supply. These communities also must protect their existing water rights and resources. Consequently, water is needed for both direct supply and for mitigation to protect surface water quality and quantity (municipal water demands).

The state's water policy making body, the Oregon Water Resources Commission (OWC), has developed policies and rules in the Willamette Basin Program (OAR Chapter 690, Division 502) that have the effect of directing water users to the basin's storage projects for future water supplies. The efficiency of regionalization and the uncertainty associated with existing water supplies further underscore the need for municipalities to have access to water stored in the Willamette Basin Project reservoirs.

To estimate the amount of stored water that the municipal water providers in the southern Willamette Basin may need, a forecast of future water demand was developed. The following section describes the methodology for developing a unified demand, and the short-term and long-term demands that could be expected.

2.2 Municipal Future Water Demand Projections

Current water demands and forecasted water demands for years 2025 and 2050 have been developed for the participating seven communities. It should be noted that the seven participating communities comprise approximately 99 percent of the population of all 14 of the southern Willamette Basin communities. From this information, an estimated need for water for these communities from the Willamette Basin federal storage projects was developed at two timeframes. The following sections detail how these projections were developed and describe an estimated projected need to access and use stored water.

Methodology

The following methodology was used to develop a unified future water demand for the seven participating communities. Average per capita water demand on a monthly basis for each of the seven participating communities was determined based on monthly water demand records provided by each community, and population estimates by Portland State University for 2006 and 2007. These average per capita numbers then were applied to future population projections for the years 2025 and 2050 to forecast a baseline water demand estimate by month. Individual

city forecasts then were totaled to provide a baseline total estimated monthly water demand for the years 2025 and 2050. A plus and minus 20 percent confidence interval was then computed from the baseline water demand estimate to take into account variability in future water use patterns from conservation, climate change, and other factors that may influence the demand profiles. The 20 percent confidence interval is also intended to address future uncertainties in population growth rates. To isolate future water demands, the current water demands were subtracted from the estimated future demands. Tables outlining the forecasts by community and in total are included in Appendix 1.

Findings

Using the above-described methodology, the existing annual water demand for the participating communities was determined to be 52,000 acre-feet. The demand projections for the seven participating municipalities in 2050 show an estimated need for 76,000 to 114,000 acre-feet of water annually. Based on a comparison of existing demand to forecasted demand, it is estimated that these communities will need between 7,000 and 37,000 acre-feet of additional supply by 2025. Similarly, in 2050, these communities may need between 24,000 and 62,000 acre-feet of additional water supply annually.

2.3 Limitations on Water Supply Options

Based on their projected future water demands, many of the southern Willamette Basin municipalities have obtained water rights and continue to seek additional water rights to ensure adequate long-term water supplies. There are, however, numerous limitations that call into question these communities' ability to obtain additional water rights, or to fully use their existing water rights. The following is a summary of some of the most significant limitations.

1. **Water Quality**
   Several of the limitations are related to the existing conditions in the southern Willamette Basin water sources. Both surface water and groundwater sources have a variety of water quality limitations. Most surface water bodies in the southern Willamette Basin are designated as water quality limited by the Oregon Department of Environmental Quality (DEQ). Summer water temperature is increasingly becoming a concern, and DEQ recently established a total maximum daily load (TMDL) for temperature on the mainstem of the Willamette River. Additionally, some of the communities rely on groundwater that has high levels of naturally occurring iron, manganese, and arsenic.

2. **Water Quantity**
   Most of the surface water sources in the southern Willamette Basin are deemed to be over-appropriated and do not have water available during the high-demand months. This lack of water availability also can affect the use of groundwater if OWRD determines that it will affect, to an impermissible degree (referred to as the potential for substantial interference), the over-appropriated surface water source. As a result,

OWRD could deny a new groundwater application because of the hydraulic connection with an over-appropriated surface water source.

3. **Basin Program Classifications**
   Existing laws create other limitations for water supply options. One example is the basin programs rules promulgated by the OWC in 1992 that "classify" the types of beneficial uses for which OWRD may issue new water rights. These rules classify most of the surface water sources in the southern Willamette Basin for only a very limited number of purposes during at least the summer months of each year. These limited classified purposes are primarily domestic, livestock, and public instream uses, and do not include municipal purposes.

4. **OWC Rules Connecting Groundwater to Surface Water**
   OWC rules establish that hydraulically connected groundwater in the Willamette Basin is classified the same as the surface water source. As described in paragraph 3 above, these limited classifications do not allow the use of water year-round for municipal purposes from most of the surface water sources. Consequently, groundwater hydraulically connected to these surface water sources is not classified for year-round municipal purposes.

5. **Protection of Listed Fish**
   The ability to acquire a new water right or to use water under existing water rights can also be affected by the existence of listed fish species in the affected water source. For example, under current law, if a municipality needs an extension of time to fully develop an existing water use permit issued before November 2, 1998, the Oregon Department of Fish and Wildlife (ODFW) will recommend conditions to OWRD that are intended to "maintain the persistence" of listed fish species. This likely will result in limiting access to water under existing water rights needed to meet growing demands. In addition, under the process to obtain a new water right, OWRD will request comments from ODFW and DEQ. As part of this "Division 33 review", ODFW may recommend denial of an application or conditioning of the resulting permit to protect fish expected to be affected by the proposed use of water.

6. **OWC Policies Favoring Stored Water**
   As previously described, the rules of the OWC significantly affect the ability of municipalities to obtain additional water rights in the southern Willamette Basin. The OWC has expressed a clear preference for the use of stored water from the Willamette Basin Project over the use of direct stream flow (live flow). Accordingly, the OWC's rules make it difficult for municipalities to obtain new water rights from live flow. This puts growing communities in the southern Willamette Basin into a no-win situation because they are currently unable to obtain contracts for water stored in the federal storage projects in the basin based on the existing storage water rights. (See further discussion about the limitations on the storage water right certificates in Section 4. II.) The only relief from this quandary is to request a basin program exception. The OWC has issued multiple exceptions in the past, which seems to highlight the inconsistency between its policy objectives and the inability to obtain contracts for stored water.

7. **House Bill 3038 Changes to the Permit Extension Process**
House Bill 3038 changed the process by which OWRD extended the development time frames for pre-1998 municipal water use permits. As discussed in paragraph 5 above, ODFW now reviews many permits and recommends conditions for inclusion in OWRD's extension orders. Many of these conditions are tied to flow targets largely influenced by operation of the Willamette Basin Project. The result of these changes to the extension process has resulted in decreased security for long-term water supplies for communities.

8. **Lack of Adjudication for the Willamette Basin**
To date, OWRD has not initiated a general stream adjudication for the Willamette Basin, which would determine the validity of claims of water rights pre-dating the 1909 water code. Until such claims have been adjudicated, a municipality cannot be assured that its claim will be approved and a certificate confirming its right issued.

2.4 Municipal Demand for Mitigation Water

As a result of the need for additional water for growing communities and the limitations on water use described above, there is increasing need for water associated with mitigation. Increasingly, those who apply for new water rights, whether from groundwater or surface water, must provide mitigation water to offset the impact of the proposed use to obtain a water right from the OWRD.

OWRD may require a water right applicant to provide mitigation before obtaining a water use permit to address many of the limitations described above, including: (1) the designation of total maximum daily loads and other water quality issues, (2) Endangered Species Act (ESA) issues, (3) minimum flows to "maintain the persistence" of listed fish in connection with extensions of time for municipal water right permits, (4) groundwater in hydraulic connection with over-appropriated and restrictively classified surface water, and (5) reducing impacts to other existing water right holders.

Currently, water right applicants in the southern Willamette Basin might be able to obtain required mitigation water by identifying other existing water rights that can be transferred instream or cancelled. Identifying and contracting with individual water right holders to cancel or otherwise tie up their water rights is typically a lengthy, uncertain, and expensive process. The market for using existing water rights as mitigation is not well developed. Thus, existing methods for obtaining mitigation water are insufficient and create a bottleneck that restricts growing communities from securing water supplies needed for long-term growth and economic development.

The OWC's Willamette Basin program rules contain a specific provision addressing the release of stored water as mitigation. OAR 690-502-0240 states:

> **Groundwater-Surface Water Hydraulic Connection**
> These rules are in addition to the requirements of OAR chapter 690, division 009. Groundwater in unconfined alluvium within 1/4 mile of the banks of a stream or surface water source is presumed to be in hydraulic connection with the surface water source, unless the applicant or appropriator provides satisfactory information or demonstration to the contrary. This hydraulically connected groundwater shall be classified the same as the surface source. This section shall not apply to those groundwater uses exempted by ORS 537.545. **Notwithstanding such classification, permits may be issued for the use of water from a well in an unconfined aquifer that is hydraulically connected to groundwater, within a quarter mile of a stream, provided that surface water impacts are <u>mitigated through storage releases</u>. (Emphasis added.)**

In developing this provision, the OWC specifically anticipated that federal stored water in the Willamette Basin could be used for mitigation. Yet, applicants for new groundwater permits are not able to provide storage releases from the federal projects because there currently is not a mechanism in place to do so.

If water held in the federal storage projects was available by contract for use as mitigation, this would help eliminate a significant hurdle to obtaining water supplies needed to meet growing municipal demand in the southern Willamette Basin.

2.5 Municipal Demand for Stored Water

Given the uncertainties associated with diverting additional water under existing water use permits and the ability to obtain new water rights, it becomes clear that some portion of the future water demand for the southern Willamette Basin municipalities must come from stored water. For the purposes of evaluating the viability of accessing and using the water stored in the Willamette Basin Project to meet future need, we assumed that up to 50 percent of the future water supply could come from stored water. This stored water could be used to meet "new" demand, provide redundancy to existing supply, and be used as "mitigation water" to allow the use of existing supply.

Long-Term

Long-term planning is generally associated with timeframes of 20 to 50 years. It is assumed that under this timeframe the uncertainties associated with use of stored water for M&I purposes from the Willamette Basin Project will be resolved. Consequently, municipalities will have the ability to meaningfully evaluate federal storage as a supply option and develop necessary infrastructure to use this source with the needed assurances.

Assuming that 50 percent of the additional required supply will come from stored water, the seven participating southern Willamette Basin communities could make beneficial use of between 3,500 and 18,500 acre-feet in 2025, and between 12,000 and 31,000 acre-feet of water

from federal storage projects by the year 2050. The projected municipal need for stored water in 2025 constitutes between 0.2 percent and 1.1 percent of the water stored in the Willamette Basin Project for future use, and the projected municipal need for stored water in 2050 constitutes between 0.7 percent and 1.9 percent of this stored water.

Short-Term

Short-term planning is generally associated with timeframes of less than 10 years. Capital planning for the 5- or 10-year timeframes is generally used to establish customer rate and system development charges for water utilities. Because accurate costs for infrastructure must be developed, it is critical to be able to plan how water resources will be developed in advance of these timeframes to provide certainty to obligations to serve future water needs. Without assurance for long-term contracts at prices commensurate with other supply options, municipalities cannot develop the infrastructure necessary to use water stored in the Willamette Basin Project reservoirs to serve their existing demands.

In the short-term, however, assuming some base level of certainty and price, some southern Willamette Basin communities could be in a position to access and use stored water, including the City of Veneta. Moreover, several of the SWMWP members may have a need for water to mitigate for uses of water from other existing sources. As described, the communities need a source of water that could be protected instream to offset the impacts to surface water from groundwater pumping, to maintain the persistence of listed fish as part of a municipal permit extension process, or to address water quality concerns. The communities in the southern Willamette Basin could, consistent with OWC policy and rules, meet this need through contracts for the use of federally stored water in the near term, without the need to develop costly infrastructure. The total short-term water need for these communities is estimated at between 500 and 1,000 acre-feet annually, which constitutes between 0.03 percent and 0.06 percent of the water in the Willamette Basin Project stored for future use.

2.6 Conclusion

In summary, the seven southern Willamette Basin communities are projected to require a limited amount of stored water (500 to 1,000 acre-feet) in the short term to potentially meet municipal water demand and to provide mitigation water instream to offset the impacts of the use of water from other water sources. After these purchases of stored water have the requisite level of certainty and equitable cost, municipalities could rely on stored water to meet their needs for source redundancy and additional base load supply, in addition to mitigation needs. Long-term projections to the year 2025 indicated that these communities could require between 3,500 and 18,500 acre-feet, and projections to the year 2050 indicate a need for between 12,000 and 31,000 acre-feet of water from federal storage projects to meet increasing municipal water demands. As previously described, the communities' immediate need for stored water from the Willamette Basin project for mitigation purposes constitutes approximately 0.05 percent of the water stored for future use. The municipal demands for stored water in 2025 and 2050 range between 0.2 percent and 1.9 percent of the total amount of water stored for future use.

Section 3. Overview of the Willamette Basin Project

3.1 Introduction

A significant step in this water supply planning project was to review the current status of the Willamette Basin Project to understand the opportunities and limitations associated with obtaining access to this stored water. This effort included describing the Willamette Basin Project; understanding how the Willamette Basin Project was authorized, exploring the authorities regulating various elements of the Willamette Basin Project, and summarizing how the stored water is currently used. Much of this process is an expansion of the work done as part of the Willamette Basin Reservoir Study during the previous decade.

3.2 Willamette Basin Reservoir Study Background

The Willamette Basin Reservoir Study, which began in June 1996, was co-sponsored by OWRD and USACE. The purpose of the study was to analyze water use and project water demand for a variety of uses in the basin, and identify ways to allocate reservoir water to assure the most public benefit within the policies and regulations of the USACE. The study was intended to evaluate whether changes in the operation, storage, and allocation of water in the existing Willamette Basin reservoirs would better serve current and anticipated water resource needs. Although the Reservoir Study was originally scheduled for completion in 2001, it was put on "hold" status in 2000 following listing of Willamette River Chinook and steelhead as threatened under the ESA. The partners in the Reservoir Study agreed that long-term decisions regarding allocation of the reservoir storage could not be completed until requirements for listed species were clarified. Until recently, the USACE was in Section 7 consultation with the National Marine Fisheries Service and U.S. Fish and Wildlife Service regarding continued operation of the Willamette reservoir system and its effects on fish, wildlife, and plant species listed under the ESA. This consultation was completed and a BiOp was issued in August 2008. (See discussion below related to minimum flow section.)

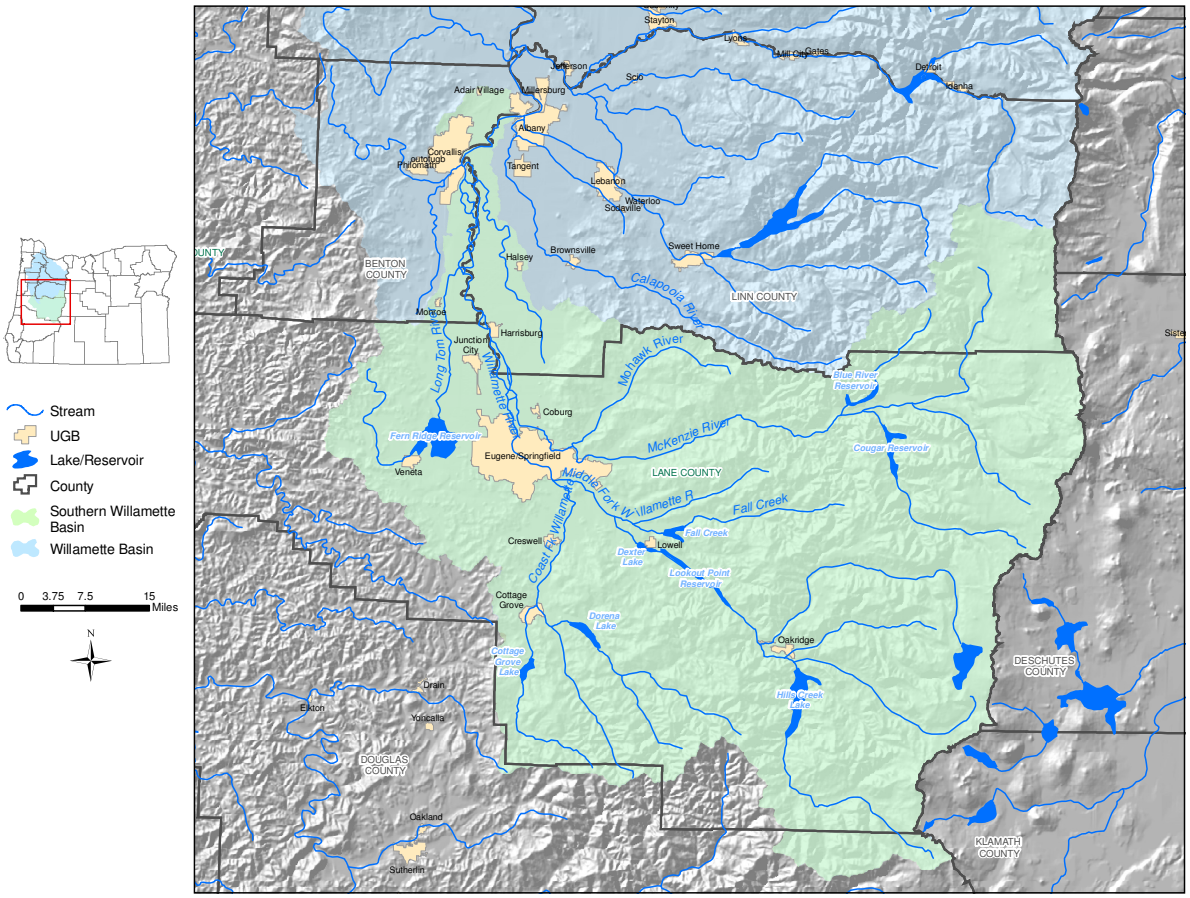
As part of the Willamette Basin Reservoir Study, the economic, social, environmental, and other relevant characteristics of the basin were described in their existing state. This information was compiled in a 94-page review draft document titled "Criteria and Discussion of Existing and Base Conditions," which was last revised in September 1999. This Base Case study provides extensive information about the existing conditions in the Willamette Basin at that time. The information included in the draft document ranged from socioeconomic conditions to water quality and erosion data, and included assessments of the existing water demand for agricultural irrigation, municipal and industrial supply. For additional information, see the Base Case Study, which is posted at:

http://www1.wrd.state.or.us/files/uploads/Army%20Corps/Southern%20Willamette%20Project/ . OWRD and USACE also produced a review draft of an Interim Report in 1999 and a Willamette Basin Reservoir Study 2001 Update, which provides an overview of the study and a discussion of the then ongoing ESA consultation process.

3.3 The Southern Willamette Basin Federal Reservoirs

The federal storage projects in the Willamette Basin consist of 13 dams operated for the purposes of flood control, irrigation, water quality, and recreation. As recognized in the authorizing documents, the annual weather patterns and the runoff characteristics of the basin allow the system to be operated to balance the range of authorized purposes. The well-defined limits of the flood season and planned use of storage space after the flood season allows for the impoundment of spring runoff. During the summer and early fall months, stored water is either retained in the conservation pool for recreation, or released downstream to meet other authorized purposes. Water is released according to each project's drawdown priority. Starting after Labor Day, water is released from reservoirs to bring them back down to their minimum flood control pool elevations to provide storage for the winter flood season. The reservoirs in the Willamette Basin Project have a total storage of 2.6 million acre-feet. The reservoirs have conservation storage of 1.64 million acre-feet. (Conservation storage is the amount of water that is stored in a reservoir for future use after some of the water from high-flow events is released.) Nine of these reservoirs are in the southern Willamette Basin, including the Dexter re-regulating facility. These reservoirs are Cottage Grove, Dorena, Fall Creek, Hills Creek, Lookout Point, Dexter, Blue River, Cougar, and Fern Ridge, as shown in Figure 3-1.

Figure 3-1. Federal Reservoirs in the Southern Willamette Basin



Reservoir Descriptions

The following descriptions of the nine federal storage projects in the southern Willamette Basin are based on information in the 2001 Comprehensive Water Supply Study conducted by the USACE[1], and an overview of the USACE dams and reservoirs developed by OWRD as part of the Willamette Basin Reservoir Study.[2] The reservoir descriptions are organized according to the river systems on which the reservoirs are located.

The descriptions for each reservoir include the location of the reservoir, the year construction was completed, the amount of water the reservoir can hold, as well as its total conservation storage.

[1] IWR Report 01-PS-1, comprehensive Water Supply Study: An examination of current water supply issues, September 2001.
[2] Willamette Basin Reservoirs (not dated).

Coast Fork Willamette River

Cottage Grove
The Cottage Grove dam and reservoir are located on the Coast Fork Willamette River about 6 miles south of Cottage Grove in Lane County. The dam was completed in 1942. The reservoir stores 32,900 acre-feet in total. Some of this water is released soon after high-flow events, leaving a somewhat smaller amount of conservation storage of 28,700 acre-feet of water stored.

Dorena
The Dorena dam and reservoir are located on the Row River, a tributary of the Coast Fork Willamette River about 6 miles east of Cottage Grove in Lane County. The dam was completed in 1949. The reservoir stores 77,600 acre-feet in total, with conservation storage of 65,000 acre-feet.

Middle Fork Willamette River

Fall Creek
Fall Creek dam and reservoir are located on Fall Creek, a tributary of the Middle Fork Willamette River. The dam was completed in 1966. The reservoir stores 125,000 acre-feet of water in total, with conservation storage of 108,200 acre-feet.

Hills Creek
Hills Creek dam and reservoir are located on the Middle Fork Willamette River, about 45 miles southeast of Eugene in Lane County. The dam was completed in 1961. The reservoir stores 355,500 acre-feet of water in total, with conservation storage of 194,600 acre-feet.

Lookout Point
The Lookout Point dam and reservoir are located on the Middle Fork Willamette River, 26 miles downstream from the Hills Creek project in Lane County. The dam was completed in 1955. The reservoir stores 455,800 acre-feet of water in total, with conservation storage of 324,200 acre-feet.

Dexter
The Dexter project is located 2.8 miles downstream from Lookout Point project on the Middle Fork Willamette River in Lane County and is a re-regulation facility for Lookout Point. The dam was completed in 1955.

McKenzie River

Blue River
Blue River dam and reservoir are located on the Blue River, a tributary of the McKenzie River, and are about 38 miles east of Eugene in Lane County. The dam was completed in 1969. The reservoir stores 89,500 acre-feet of water in total, with conservation storage of 78,800 acre-feet.

Cougar

Cougar dam and reservoir are located on the South Fork McKenzie River about 42 miles east of Eugene in Lane County. The dam was completed in 1964. The reservoir stores a total of 219,000 acre-feet, with conservation storage of 143,900 acre-feet.

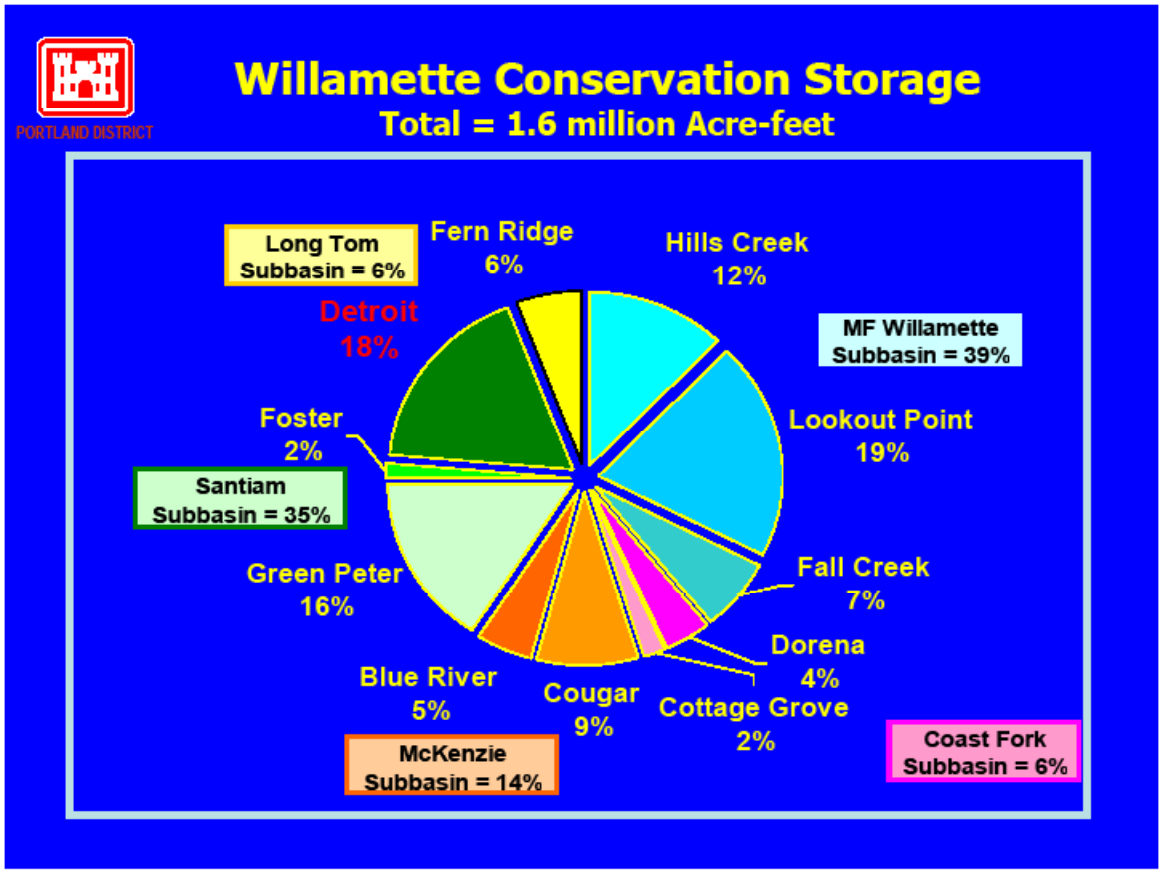
Long Tom River

Fern Ridge

Fern Ridge dam and reservoir are located on the Long Tom River, a tributary of the Willamette River, and are about 12 miles west of Eugene in Lane County. The dam was completed in 1941. The reservoir stores 116,800 acre-feet of water in total, with conservation storage of 93,900 acre-feet.

Figure 3-2, which was developed by the USACE Portland District, depicts the percentage of the total conservation storage in each of the reservoirs in the Willamette Basin Project.

Figure 3-2. Total Conservation Storage in the Willamette Basin Project



Authorization of the Willamette Basin Project

When Congress authorizes construction of storage projects, the authorizing legislation identifies, either directly or indirectly, the uses for which the project is being developed. This authorization is fundamental to understanding how the Willamette Basin Project is operated and how it may be operated in the future.

The Flood Control Act of June 28, 1938,[3] approved the general comprehensive plan for development of the water resources of the Willamette River Basin. This Act authorized construction of a system of reservoirs and refers to a "general comprehensive plan for flood control, navigation, and other purposes."[4] The Flood Control Act of 1950 expanded authorization for the USACE to construct and operate the Willamette Basin Project, as described in House Document 531, which describes the Willamette Basin Project. House Document 531 identifies the accomplishments intended for the reservoir project, and states that the "primary accomplishment of the proposed plan of improvement will be the control of floods and solution of major drainage problems. After the flood season, stored water will be released in a manner best suited to provide increased depths for navigation, for generation of hydroelectric power and for the several conservation uses—namely, irrigation; potable water supply; and reduction of stream pollution in the interests of public health, fish conservation and public recreation."[5]

Table 3-1, developed by the USACE, summarizes the authorized purposes for the Willamette Basin reservoirs.

Table 3-1 Authorized Uses for Willamette Basin Projects

Purpose	Det	BgC	Fos	GrP	BlR	Cou	LkP	Dex	FlC	HlC	CGr	Dor	Frn
Flood Control	X	X	X	X	X	X	X	X	X	X	X	X	X
Navigation	X	X	X	X	X	X	X	X	X	X	X	X	X
Hydropower	X	X	*	*	**	*	X	X		X			
Irrigation	X	X	X	X	X	X	X	X	X	X	X	X	X
Fisheries	X	X	X	X	X	X	X	X	X	X	X	X	X
Pollution Abatement	X	X	X	X	X	X	X	X	X	X	X	X	X
Water Supply	X	X	X	X	X	X	X	X	X	X	X	X	X
Recreation	X	X	X	X	X	X	X	X	X	X	X	X	X

X= Authorized purpose as listed in the 1950 FCA
*=Flood Control Act of 1954 added hydropower to Foster (formerly White Bridge), Green Peter, and Cougar Dams
** = Water Resources Development Act (WRDA) 1986 added hydropower to Blue River (private sector given first opportunity to add hydropower via FERC license)

Dams:
Det: Detroit Dam, N. Santiam River
BgC: Big Cliff Dam, N. Santiam River
Fos: Foster Dam, S. Santiam River
GrP: Green Peter Dam, S. Santiam River
BlR: Blue River Dam, McKenzie R. tributary
Cou: Cougar Dam, S. Fork McKenzie River
LkP: Lookout Point Dam, Middle Fork Willamette
Dex: Dexter Dam, Middle Fork Willamette
FlC: Fall Creek Dam, Middle Fork Willamette tributary
HlC: Hills Creek Dam, Middle Fork Willamette tributary
Frn: Long Tom River
CGr: Cottage Grove Dam, Coast Fork Willamette
Dor: Coast Fork, Willamette River

[3] 52 Stat 1215.
[4] 52 Stat. at 1222.
[5] House Document 531 at 246.

House Document 531 expressly addresses the need for municipal water supply from the storage projects. The document states: "[a]mple storage in individual reservoirs will be made available at relatively low cost for domestic use, and a reasonable charge could be made for stored water used by municipalities for domestic purposes."[6] The annual benefit for this use was projected to be $307,800.[7] Nonetheless, to date, the stored water from the Willamette Basin Project has been used for every authorized purpose except M&I use, as described below.

Regulatory Authorities

The Willamette Basin Project is operated and maintained by the USACE Portland District. The storage of water in the reservoirs and the use of the stored water must, under state law, be authorized by the OWRD. The USBOR, as the federal agency with responsibility for providing services to irrigators, applied to OWRD for the water rights to store water for irrigation in the reservoirs. (The water rights are described in more detail in Section 4.) USBOR, on behalf of the federal government, holds the water rights issued by OWRD and issues contracts to provide the stored water for irrigation purposes. This division of functions reflects the historical practices of these agencies. The USACE generally constructs projects on behalf of the federal government, and USBOR issues contracts for storage space for water to be used for irrigation. Any individual or entity that enters into a contract to use the stored water also must obtain a water right (to use stored water) from OWRD.

Current Use of Stored Water

The Willamette Basin federal storage projects can store a total of 2,416,000 acre-feet of water. As previously stated, much of this volume is used for flood control storage and the water is released soon after it is stored. The remaining water stored for later use is referred to as "conservation storage." The total conservation storage for the Willamette Basin Project is variously described as being between 1,593,600 and 1,640,000 acre-feet. The conservation storage for the federal storage projects in the southern Willamette Basin, which is the focus of this report, is 1,037,300 acre-feet.

The USACE has not allocated the storage within the reservoirs in the Willamette Basin for the various uses for which the reservoirs were authorized, although USACE has allocated the costs and benefits of operating the system. (See the discussion in subsection 4.III.A.) Nonetheless, stored water within the reservoirs is being used for beneficial purposes in addition to irrigation. The USACE releases stored water to meet minimum mainstem flows and the stored water is intended to be used for navigation, recreation, water quality, and benefits to fish and wildlife.

In its 2001 study, the USACE developed a summary of the existing and projected operational requirements for the Willamette Basin Project (see Table 3-2). Excluding hydropower, the USACE showed a use between 310,000 and 410,000 acre-feet in 2001, and projected the additional conservation storage requirements to be approximately 200,000 acre-feet in 2020 and

[6] House Document 531 at 247.
[7] House Document 531 at 248 and 1849.

760,000 acre-feet by 2050, as shown in Table 3-2.[8] The projected demands for water supply were based on reservation requests from the early 1990s.

Table 3-2. Summary of Storage Requirements (acre-feet)

Purpose	Current Use*	Projected 2020 in Addition to Current Use*	Projected 2050 in Addition to Current Use*	Total Future Basin Requirements
Irrigation	60,000	95,500	550,500	610,500
Fish	0	0	0	0
Water Quality	250,000 to 350,000	Unknown	Unknown	At least 350,000
Recreation	0	0	0	0
Water Supply	0	103,000	208,000	208,000
Total	310,000 to 410,000	At least 200,000	At least 760,000	1,070,000 to 1,170,000

* "Current Use" as of 2001.

As shown in Table 3-2, the USACE projected a need for stored for "water supply" in the amount of 103,000 acre-feet in 2020 and 208,000 acre-feet in 2050.

Hydropower

The Hills Creek, Lookout Point, and Cougar facilities generate hydropower. The Hills Creek facility's exclusive power storage is 49,000 acre-feet between pool elevations 1,414 and 1,448 feet. Lookout Point has exclusive power storage of 12,300 acre-feet between pool elevations 819 and 825 feet. The Cougar facility has exclusive power storage of 9,900 acre-feet between pool elevations 1,516 and 1,532 feet. Combined, these facilities have exclusive power storage of 71,200 acre-feet.

Irrigation

As previously described, irrigation is the only use of the Willamette Basin project stored water authorized under a State of Oregon water right. USBOR issues the contracts for the use of water stored in the federal project reservoirs for irrigation purposes. In May 2007, USBOR reported a total of 205 long-term contracts were in place for the use of up to 50,231 acre-feet of irrigation water from the Willamette Basin Project. In addition, USBOR received, but has not yet processed, requests for an additional 29,477 acre-feet, which if approved, would raise volume of storage under long-term contracts to 79,708 acre-feet. The contracts do not provide water from a particular reservoir because the USACE operates the federal projects as a system. Nonetheless, the contracts in the southern Willamette Valley can be identified by the river reach descriptions. Information provided by USBOR shows 154 contracts in the southern Willamette Valley, for a total of 41,877 acre-feet. Table 3-3 summarizes those contracts in the southern part of the valley.

Table 3-3. 2008 Irrigation Contracts in southern Willamette Valley

[8] IWR Report 01-PS-1, Table 8, pages 12-13.

Reach Description	Number of Contracts	Total Acre-Feet
Willamette River Mainstem		
Santiam River to Long Tom River	24	12,424
Long Tom River to McKenzie River	6	769
McKenzie River to Fall Creek	1	10
Long Tom River	63	24,594
McKenzie River	38	1,740
Middle Fork Willamette River		
Fall Creek downstream to Willamette River	4	959
Upstream of Fall Creek	4	95
Fall Creek	2	13
Coast Fork Willamette River		
Row River downstream to Willamette River	10	1,166
Upstream of Row River	1	56
Row River	1	51
Total	154	41,877

The future use of stored water for irrigation may be affected by the BiOp for the Willamette Basin Project issued by the National Oceanic & Atmospheric Administration, National Marine Fisheries Service (NOAA Fisheries) on July 11, 2008. The BiOp specified a number of restrictions that will be placed on renewal of existing contracts, as well as new contracts for use of stored water from the Willamette Basin Project for irrigation during the 15-year period of the BiOp. The following measures are intended to minimize the effects of water diversions by USBOR's contractors on listed fish species and their habitat. These measures include:

1. Limiting the total amount of stored water that can be provided under existing and new irrigation contracts to 95,000 acre-feet without renewed consultation with NOAA Fisheries and the U.S. Fish and Wildlife Service.
2. Requiring new and existing contract diverters to install screens and other fish passage devices within a specified timeframe.
3. Ensuring that water released to serve contracts does not prevent meeting minimum flow objectives.
4. Reducing the volume of stored water diverted by contract holders in low water years to ensure minimum objectives are met.
5. No new contracts will be issued in the North and South Santiam Rivers until additional flow studies are performed by USACE.

Recreation

The stored water in the Willamette Basin Project also is used for recreation. The Willamette Basin Reservoir overview developed by OWRD and the USACE provided information about the average yearly number of recreational visits. Table 3-4 provides a summary of that information.

Table 3-4 Recreation in Southern Willamette Basin Project Reservoirs

Project	Average Annual Recreational Visits	Number of Public Recreation Areas
Lookout Point	97,000	6
Dexter	321,000	2
Cottage Grove	417,000	5
Dorena	343,000	5
Fern Ridge	768,000	5
Hills Creek	109,000	5
Fall Creek	269,000	5
Cougar	64,000	6
Blue River	66,000	3

Minimum Flows

Finally, the stored water in the Willamette Basin Project is used to maintain flows in the downstream rivers, particularly the mainstem Willamette River. It appears that the original target flows at Albany and Salem were provided in House Document 544, 75 Congress, 3rd Session (1938) to facilitate navigation. These flows appear to have been increased to current levels by House Document 531 in an effort to provide pollution abatement benefits.[9] The BiOp for the Willamette Basin includes the most recent minimum flow objectives for the Willamette River and its tributaries. Table 3-5 identifies the BiOp's "mainstem Willamette flow objectives" and also includes the "deficit flows" specified in the BiOp.

Table 3-5. BiOp Flow Objectives and Deficit Flows

Period	Albany	Salem	Salem	Salem
	Mainstem Willamette Flow Objective Minimum Flow (cfs)	Mainstem Willamette Flow Objective 7-Day Moving Average Minimum Flow (cfs)	Mainstem Willamette Flow Objective Minimum Instantaneous Flow (cfs)	Deficit Flows (based on 2001 water year) Weekly Average
April	Not defined	17,800	14,300	15,000
May	Not defined	15,000	12,000	15,000
June 1-15	4,500	13,000	10,500	11,000
June 16-30	4,500	8,700	7,000	5,500
July	4,500		6,000	5,000
Aug 1-15	5,000		6,000	5,000
Aug 16-31	5,000		6,500	5,000
September	5,000		7,000	5,000
October	5,000		7,000	5,000

cfs = cubic feet per second.

[9] House Document 531 at 1732.

The mainstem Willamette flow objectives are a combination of the minimum flows previously established for navigation in 1938, as measured at Albany and Salem for the June through October period, which guided historical operations, and the new mainstem "fish flow" objectives for April through June. The "biological minimum flow objectives," or "spring flows," refer to the minimum level of flow that the fisheries agencies have indicated are needed for migrating adult and juvenile salmon and steelhead during the spring (April through June) runoff period. The BiOp describes these spring flows as the minimum levels of flow recommended to "sustain" anadromous fish populations in the Willamette Basin on a "long-term basis." The USACE has been using the spring flow targets as primary operating criteria since 2000.

The BiOp defines different water years as being abundant, adequate, insufficient, or deficit. The BiOp minimum flow objectives for the mainstem Willamette River set forth in Table 3-5 should be met or exceeded in abundant[10] and adequate[11] water years. In insufficient water years,[12] the operational flow targets may be less than the minimum flow objectives, proportional to the expected mid-May system-wide storage capability, down to a minimum of the "deficit flows," as detailed in Table 3-5. The deficit flows are based on the 2001 water year. In deficit water years, it is unlikely that even the deficit flow thresholds would be met. In such years, the operational flow targets would be below the "deficit flows" and the USACE must balance the competing uses in light of the shortage of water. Thus, operational flow targets may be less than the mainstem Willamette minimum flow objectives based on the type of water year. Furthermore, it is important to note that the BiOp's mainstem Willamette flow objectives are subject to annual amendment based on new information. The BiOp specifies that adaptive flow management is preferable to establishing fixed operating criteria because the Willamette Basin is a highly rain-dependent system with variable springtime flows.

The USACE prepares an annual operating plan for the conservation storage and release seasons (February – October) in the Willamette Basin. This plan is called the Willamette Conservation Plan (WCP). The WCP describes how the authorized project purposes will be accomplished during the conservation storage and release seasons given the volume of water forecasted to be available during the water year. The WCPs will set operational flow targets based on the type of water year. Preparation of the WCP begins in January following release of the initial water supply forecast for the basin from the National Resources Conservation Service. The WCP is finalized by late May. The USACE coordinates development of WCPs with state and federal

[10] "Abundant" System-Wide Storage Conservation Storage Volume: Anticipate greater than 1.48 MAF in system storage by mid-May and having a relatively high probability of filling the three high-priority recreation reservoirs (Detroit, Fern Ridge, and Foster) throughout the summer (May through August) while fully meeting flow objectives at Salem (See BiOp Tables D-1 and D-2).

[11] "Adequate" System Wide Storage Conservation Storage Volume: Anticipate 1.20 to 1.48 MAF in system storage by mid-May and having a relatively high probability of filling the three high-priority recreation reservoirs through most but not necessarily all of the summer while fully meeting flow objectives at Salem.

[12] "Insufficient and Deficit" System Wide Storage Conservation Storage Volume: There would not be a sufficient amount of runoff to meet all of the flow objectives in BiOp Tables D-1 and D-2 while permitting high priority Willamette reservoirs to fill to a level that would support recreational use throughout most of the summer.

agencies. In the future, a technical Flow Management (FM) Committee of the Willamette Action Team for Ecosystem Restoration (WATER) will play a key role in coordinating with the USACE for development of the WCP. The BiOp states that the operational flow targets determined by this process are intended to balance the risks to listed fish species under low water year conditions with the risks to other uses authorized by Congress for the Willamette Basin Project.

3.4 Conclusion

As described above, the federal storage projects in the Willamette Basin have total conservation storage of approximately 1.6 million acre-feet. The conservation storage for the nine federal storage projects in the southern Willamette Basin described above is 1,037,300 acre-feet. The Willamette Basin Project was authorized for numerous purposes, including irrigation, water supply, and pollution abatement. The USACE has not allocated the storage in the Willamette Basin Project. Nonetheless, this stored water is currently being used to fulfill irrigation contracts; generate hydropower; and meet instream needs for navigation, recreation, and fish and wildlife purposes. In fact, it appears that of all the authorized purposes for the Willamette Basin Project, municipal water supply is the only authorized use that is not currently receiving stored water.

These current conditions provide a starting point for understanding the potential future use of water stored in federal projects in the southern Willamette Basin. Potential impediments, including some of the existing policies of the regulating agencies, must be fully understood in order to move forward with assessing the opportunities to use the federal storage projects to meet municipal water demands.

Section 4. Impediments to Obtaining M&I Water from the Willamette Basin Project

4.1 Introduction

To identify a pathway for the SWMWP to obtain water stored in the Willamette Basin Project to meet future water demands, an understanding of the existing impediments is essential. The work of the Willamette Basin Study included identifying such impediments. The primary impediments to the use of stored water from the Willamette Basin Project have been identified as the limitations in the USBOR's existing storage water rights, the anticipated pricing formulas for the various municipal water demands, and the necessity of identifying an entity to assume the role of contracting authority. Each of these impediments is considered below and potential solutions to these impediments are offered.

4.2 Storage Water Rights Held by USBOR

On August 28, 1996, OWRD issued to the "Bureau of Reclamation, U.S.A., Pacific Northwest Region" water right Certificates 72755 and 72756. Certificate 72755, which has a priority date of August 16, 1954, confirmed USBOR's right to store up to 835,000 acre-feet of water in Cottage Grove, Dorena, Fern Ridge, Lookout Point, and Detroit reservoirs. Certificate 72756, which has a priority date of September 16, 1968, confirmed USBOR's right to store up to 805,100 acre-feet of water in Hills Creek, Cougar, Blue River, Fall Creek, Foster, and Green Peter reservoirs. Both certificates authorized the storage of water for irrigation purposes only.[13] In other words, four years after Congress authorized the Willamette Basin Project for multiple purposes in the Flood Control Act of 1950, the USBOR filed a permit application to store the full conservation pool for irrigation purposes. USBOR's second storage permit application identified the conservation storage in the remaining reservoirs as being for irrigation as well.

The water right applications filed by the USBOR for storage of water in the Willamette Basin Project requested water rights only for irrigation purposes, but refer to the many other authorized purposes for these reservoirs. USBOR's application to store water in Cottage Grove, Dorena, Fern Ridge, Lookout Point, and Detroit reservoirs (Application R-29397) states that the reservoirs were authorized and constructed for purposes that include "flood control, river regulation, sediment control, navigation, power production, fish and wildlife conservation, recreation, domestic water, pollution abatement and irrigation." It further states that although the application relates only to storage for irrigation, the reservoirs would be used for the described joint purposes. Similarly, the application filed by USBOR for storage of water in Hills Creek, Cougar, Blue River, Fall Creek, Foster, and Green Peter reservoirs (Application R-45396) indicates that "the purposes for which the reservoirs were authorized and constructed …

[13] Certificate 72755 authorizes storage of water to be appropriated for irrigation, and Certificate 72756 authorizes storage of water to be appropriated for irrigation and supplemental irrigation.

[include] flood control, river regulation, sediment control, navigation, power production, fish and wildlife conservation, recreation, municipal and industrial water, quality control and irrigation."

As already stated, despite reference to all of the reservoirs' authorized purposes, USBOR holds water rights solely for the storage of water for irrigation purposes, and currently does not have water rights that authorize storage for M&I purposes, or for any other purposes such as releasing stored water to increase instream flows to protect fish. While it is understandable that USBOR would request water rights only for irrigation, because its expertise is the reclamation of irrigable land, the end result is that the federal government holds storage rights only for irrigation purposes. As a result, OWRD cannot issue secondary water rights (water rights for the use of stored water) for purposes other than irrigation. Consequently, it currently is not possible for anyone to obtain a water right for M&I purposes from OWRD that identifies the source as water stored in one or more of the Willamette Basin Project reservoirs.

To store water and obtain water rights for purposes other than irrigation, such as M&I or instream flows for fish and wildlife, the federal government (or an entity authorized by the federal government to store water in the reservoirs) would need to hold a water right from OWRD that authorized the storage of water for such purposes.[14] Such a water right could be obtained by several methods. First, USBOR, as the water right holder of record, could apply for and obtain the authorization from OWRD to modify Certificates 72755 and 72756. Such a modification is called a water right "transfer." The transfer would need to change the beneficial purpose from irrigation to include other stated purposes, presumably the authorized purposes for the reservoirs.[15] Alternatively, the federal government (or an entity authorized to store water in the reservoirs) could apply for a new water use permit, or a limited use license, to store water in the reservoirs for all of the authorized purposes. The options are described in more detail below.

Transfer

One way to allow the storage of water in the Willamette Basin federal storage projects to meet municipal water demands would be for USBOR to file a transfer application to change the character of use for one, or both, of USBOR's storage certificates (72755 and 72756). The federal agencies have indicated that USBOR would file a transfer application at the request of USACE. To create the broadest authority, USBOR should request OWRD to change the character of use of the stored water to some or all of the authorized purposes for the reservoirs. A transfer application could be filed for all or a portion of these water right certificates. The USACE has indicated that USBOR and USACE would jointly hold the new water right issued as the result of such a transfer.

[14] Because the existing storage right authorizes storage only for irrigation, water released from the reservoirs that is not intended to supply irrigation contracts is considered public water and can be used as a source for other water rights. This situation could result in future conflicts if stored water is protected instream in the future.

[15] As described in Section 3, the authorized purposes for the Willamette Basin Project appear to be flood control, navigation, hydroelectric power, irrigation, potable water supply, pollution abatement, fish conservation, and public recreation.

New Water Right Application

As previously described, an alternative approach for obtaining authorization to store water in the Willamette Basin Project to meet municipal water demands is for the USACE (or another entity authorized to utilize the USACE reservoirs) to apply to OWRD to obtain a new water right permit to store water in one or more of the reservoirs for M&I purposes, or all of the other authorized purposes. OWRD could issue such a new water use permit, even though a storage right for irrigation purposes already exists for those reservoirs. OWRD likely would tie these water rights together by stating in the new permit that use (storage) of water under that permit, in combination with the existing certificate authorizing storage in that reservoir, cannot exceed a stated number of acre-feet. The process to obtain a new water right takes approximately eight months, although it would take much longer if the application were protested by a third party or experienced other procedural difficulties.

New Limited License Application

A third opportunity to obtain authorization from OWRD to store water in the Willamette Basin Project for purposes other than irrigation is for the USACE (or another entity authorized to utilize the USACE reservoirs) to apply to OWRD for a limited license to store water in one or more of the reservoirs for all of the authorized purposes. A limited license can be processed in a matter of weeks, but authorizes the use of water for only a limited time period of up to five years.

Although obtaining a limited license to store water for is not a long-term solution, it is an approach that could allow the federal government to store water for other authorized purposes in the near term. A limited license could create a bridge that would allow use of stored water for these purposes while a new permit application or a transfer application is being processed by OWRD.

Possible Steps Forward

The USACE has indicated that it intends to move forward with a water right transfer to change the type of use on the storage rights for the Willamette Basin Project to include the authorized purposes for these reservoirs. USACE has indicated it will request that the USBOR file the transfer application. The USACE and USBOR will jointly hold the resulting water rights authorizing storage for multiple purposes. This is an important step toward resolving this issue.

In the short term, the federal agencies could request a limited license to authorize storage for additional authorized purposes, such as low-flow augmentation and water supply.

4.3 Costs

A second impediment to making stored water from the Willamette Basin Project a viable option for meeting municipal water demand is the cost of the stored water. The cost for current

irrigation contracts issued by USBOR is approximately $8 per acre-foot plus the greater of $2 per acre or $50. According to the USACE, under current policies, the cost for M&I water would be $1,508 per acre-foot, in 1999 dollars. (See the table included in Appendix 2.)

Allocation of Costs

As discussed above, the USACE has not allocated storage in the Willamette Basin Project reservoirs to particular uses. According to the USACE, the construction costs have, however, been allocated for each reservoir. A percentage of the total cost for construction for each reservoir is allocated among the following uses:

- Hydropower
- Navigation
- Flood control
- Irrigation
- Low flow augmentation

Table 4-1, developed by USACE, shows the cost allocation percentages for the above-described uses for each of the reservoirs in the Willamette Basin Project.

Table 4-1. Joint Use Cost Percentage for Construction

Reservoir	Power (%)	Navigation (%)	Flood Control (%)	Irrigation (%)	Low-flow augmentation (%)
Detroit	40.5	0.5	47.5	11.5	0
Big Cliff	40.5	0.5	47.5	11.5	0.0
Lookout	31.0	1.0	66.0	2.0	0.0
Dexter	31.0	1.0	66.0	2.0	0.0
Hills Creek	24.5	1.5	63.0	11.0	0.0
Cougar	23.0	1.0	70.0	6.0	0.0
Green Peter	49.5	0.5	41.5	8.5	0.0
Foster	49.5	0.5	41.5	8.5	0.0
Cottage Grove	0.0	0.0	63.5	32.5	4.0
Dorena	0.0	0.0	56.5	41.5	2.0
Fern Ridge	0.0	0.0	49.5	46.0	4.5
Blue River	0.0	0.0	69.0	59.5	1.5
Fall Creek	0.0	0.0	55.0	41.5	3.5

According to the USACE's information, the largest percentage of the cost of construction was generally allocated to flood control for each of the southern Willamette Basin project dams. This percentage is as high as 70.0 percent for Cougar Reservoir. For reservoirs that generate hydroelectricity, power generation received a large portion of the cost allocation. For dams that do not generate hydropower, irrigation is allocated the second-largest percentage of the construction costs. For dams with hydropower facilities, the smallest allocation of cost is for navigation, although no allocation for navigation is assigned to dams that do not generate power. Finally, for the non-hydroelectric facilities, the smallest allocation of the construction cost is for low-flow augmentation. It is our understanding that part of low-flow augmentation was intended to provide pollution abatement for municipal effluent releases into the rivers.

According to the USACE, at the time the Willamette Basin Project was authorized in 1950, costs were allocated based on known demands at that time. Because the USACE did not have "a firm request" for M&I water at that time, no costs were allocated for M&I water supply. The potential implications of this are discussed later.

Cost Calculations

The USACE has not calculated up-to-date pricing for stored water, although this information was requested. Consequently, the following discussion is based on the USACE's 1999 Adjusted Price Levels; USACE's September 2001, Comprehensive Water Supply Study (IWR Report 01-PS-1); and the 1996 USACE Water Supply Partnership Kit.

In its 2001 Comprehensive Water Supply Study, the USACE indicated that current policy and procedures for providing M&I water to non-federal entities from the Willamette Basin Project would require reallocation under the procedures established in ER 1105-2-100, paragraphs 3-8(5) and E-57d. Under this procedure, the sponsor must pay the higher of the benefits or revenues foregone, the replacement cost, or the updated cost of storage in the federal project. According to this document, which assumed that hydropower storage would not be reallocated, the updated cost of storage would be used. In 1999, this cost would have been approximately $1,508. The document goes on to state that these costs would be "about 25 times the original cost of Fern Creek [sic] (operational in 1941) to about five times the cost for the most recent project (Blue River)," which started operations in 1969.

The 1996 USACE Water Supply Partnership Kit provides a description of factors influencing the cost to be assessed for stored water. Although the USACE has not computed current pricing for the Willamette Basin reservoirs, USACE has indicated that the methodology has not changed in the past 12 years. This document can, consequently, at least serve as a starting point for discussions.

According to the 1996 USACE Water Supply Partnership Kit, pricing for M&I water supply is dependent on several factors. One factor is whether it is a "new" project, which is a project for which construction started on or after November 17, 1986. The Willamette Basin Project reservoirs are not "new" projects because construction on all of these reservoirs began before November 17, 1986. (See construction completion dates provided in Section 3.) The second factor is whether the reservoir contains uncommitted storage space. The document states that there were 20 USACE reservoirs with M&I storage space that was not under repayment agreement in 1996. The Willamette Basin Project reservoirs are not included in the list of 20 existing projects with uncommitted storage space. (The Lost Creek project is the only Oregon project on this list.) Because the Willamette Basin Project reservoirs are not on this list, the analysis outlined in the 1996 Partnership Kit assumes a reallocation will be required. Reallocations are discussed in more detail below. The third factor is whether water is sought by a low income community, which is described as a community with a population of less than 20,000 located in a county with a per capita income of less than the per capita income of two-third of the counties in the United States. We do not believe that either Lane County or Benton County would meet this qualification. The final factor influencing the cost of stored water is the additional costs that will be assigned. These costs include a pro-rata share of the annual

operation and maintenance expenses, repair replacement, rehabilitation and reconstruction (OMRR&R) costs, and dam safety assurance costs.

As described above, the 1996 USACE Water Supply Partnership Kit indicates that reallocation of storage in an existing reservoir will be required if the reservoir at issue is not on the list of 20 reservoirs with uncommitted storage space. The document describes the reallocation process as follows. A reallocation requires a "reconnaissance" study, which is funded by the federal government. If this process yields positive results, then a more detailed "feasibility" study is undertaken, the cost of which is divided equally between the federal government and the entity seeking to obtain stored water. According to this document, the cost of reallocated storage assigned is the highest of the benefits or revenues foregone as a result of the reallocation, the replacement cost of an equivalent amount of storage in another or a new project, or the updated cost of storage in the federal project. The cost is usually determined by the updated cost of the project, which is a recalculation of the cost to construct the project at current prices. OMRR&R costs would be added to this cost.

The 1996 USACE Water Supply Partnership Kit characterizes a reallocation as "a reassignment of the usage of existing storage space in a reservoir project to a higher and better use." The USACE has indicated, however, that the storage in the Willamette Basin Project has never been allocated. Only the costs have been allocated. For this reason, a "reassignment of the usage of existing storage space in a reservoir project to a higher and better use" does not seem to be required. Accordingly, it appears that the USACE possibly could conclude that the reallocation procedure is not applicable. Although staff indicated that USACE already has considered and rejected this approach, this view appears to have merit and should be reconsidered.

If a reallocation is not required, it appears that the costs could be calculated as they would be for existing projects with uncommitted storage space because there are only irrigation contracts for 79,708 acre-feet of the total conservation storage of 1.6 million acre-feet. According to the 1996 USACE Water Supply Partnership Kit, the cost of M&I storage in these reservoirs is the actual cost assigned to the storage space at the time of construction. In 1999, the average cost calculated by the initial construction cost was $189 per acre-foot.

Regardless of whether the cost for use of stored water for M&I purposes is ultimately calculated as an existing project with uncommitted storage space or through a reallocation, it appears that a reallocation would not be necessary for contracts for low-flow augmentation. As previously described, the USACE allocated the costs for the Willamette Basin Project reservoirs among five purposes. One of these purposes was "low-flow augmentation." As described in Table 4-1, the following percentage of the cost for construction was assigned to low-flow augmentation for the five reservoirs:

- Cottage Grove 4.0 percent
- Dorena 2.0 percent
- Fern Ridge 4.5 percent
- Blue River 1.5 percent
- Fall Creek 3.5 percent

Based on these figures, it appears that under any definition of reallocation, the reservoirs have been allocated for low-flow augmentation. As a result, the USACE should not require a reallocation, with the associated higher costs, to issue a contract for water for low-flow augmentation. Instead, it appears the USACE potentially could issue a contract at the original cost of construction price. This would be appealing because that cost in 1999 was $189 per acre-foot. To date, the USACE has not indicated that it would refuse to issue contracts to municipalities for low-flow augmentation water to be used instream to provide mitigation.

Costs for Alternative Types of Contracts

In addition to entering into contracts for stored water as described above, the USACE also can enter into short-term contracts, according to the 1996 USACE Water Supply Partnership Kit. These options include contracts for surplus water, emergency water supply, and drought contingency water. Each of these options is described below.

1. **Surplus Water**
   According to the 1996 USACE Water Supply Partnership Kit, the 1944 Flood Control Act authorized the Assistant Secretary of the Army (Civil Works) to enter into agreements for surplus water with states, municipalities, private concerns, or individuals at such prices and on such terms as he or she may deem reasonable. These agreements may be for domestic and M&I uses, but not for irrigation, from surplus water that may be available at any reservoir under the control of the Department of the Army. The 1996 Partnership Kit defines "surplus water" as

   > either: 1) water stored in a Corps reservoir that is not required because the authorized need for the water never developed or the need is reduced by changes that have occurred since authorization or construction; or 2) water that would be more beneficially used as M&I water than for the authorized purpose and that, when withdrawn, would not adversely affect existing lawful uses of such water over some specified time period.

   Agreements for surplus water normally will be for small amounts of water and for temporary use, as opposed to storage reallocations and a permanent right to that storage. Surplus water agreements will be limited to a 5-year period. The cost for surplus water is determined by the same procedure as used to determine an equivalent amount of reallocated storage. The total annual price is to be limited to the annual costs of the least costly alternative, but never less than the benefits foregone, or, in the case of hydropower, revenues foregone. A 5-year extension may be granted to a water supply agreement on a case-by-case basis, and the cost will be recalculated based on current prices and interest rates.

2. **Emergency Water Supply (as a result of water quality)**
   According to the 1996 USACE Water Supply Partnership Kit, the USACE can provide emergency supplies of clean water to any locality that the Chief of Engineers finds is confronted with a source of contaminated water causing, or likely to cause, a substantial threat to the public health and welfare of the inhabitants of the locality. The governor of the affected state must request this assistance and the emergency supply is normally

limited to 30 days. The loss of water source or supply is not correctable under this authority. The Chief of Engineers determines what cost and repayment are advisable.

3. **Drought Contingency Water**
According to the 1996 USACE Water Supply Partnership Kit, the 1944 Flood Control Act provides authority for temporary withdrawal of water from USACE projects to supplement normal supplies in times of drought. The preferred approach is for a state or political subdivision to enter into an agreement with the Assistant Secretary of the Army (Civil Works) (ASA[CW]) and to agree to act as the wholesaler for all the water requirements of individual users. This relieves the ASA(CW) from having to determine who gets water. The cost for drought contingency water supply will be determined in the same manner as for surplus water. This cost recovery approach was affirmed in the USACE's IWR Report 01-PS-1.

Possible Steps Forward

The issue of cost of stored water for authorized purposes other than irrigation is integral to determining whether municipalities can access federally stored water for purposes of serving their base load, ensuring a redundant water supply and mitigating use of water from other sources. The cost of $1,508 (in 1999 dollars) calculated under current policy is unreasonable and would be cost-prohibitive for municipalities. To put this cost into perspective, EWEB estimates that it sold water in 2008 for residential use for less than $400 per acre-foot, which was the cost of treating and distributing this water. Adding this purchase price for stored water would more than quadruple the cost of EWEB's water. This issue must be equitably resolved for resolution of this situation to be meaningful.

The issue of cost is also important for the federal government. To date, municipalities have not contributed to the cost of construction of these reservoirs and there have been a limited number of irrigation contracts repaying the cost of construction. As a result, additional contracts for M&I purposes could benefit both the municipalities and the federal government.

There are several possibilities for making progress on the issue of the cost of stored water for M&I purposes and low-flow augmentation for mitigation purposes.

- The USACE could reconsider its policy requiring cost calculation based on a reallocation of the Willamette Basin Project, based on the understanding that the stored water has, to date, never been allocated. This could result in costs in the range of $189 per acre-foot.

- If the use of water from the Willamette Basin Project for M&I purposes and flow augmentation requires reallocation, the State of Oregon could enter into a memorandum of understanding (MOU) with the USACE that would include a provision, similar to the Kansas MOU, that the cost of M&I water would be based on the original cost of construction. (See discussion below.)

- The USACE could affirm that municipalities can obtain contracts for water allocated for low-flow augmentation for use as mitigation under the pricing formula based on the original cost of construction. This could result in costs in the range of $189 per acre-foot.

- Alternatively, USACE could issue short-term surplus water contracts for mitigation purposes. USACE would need to clarify the cost for such contracts.

- The USACE should develop updated adjusted costs for the Willamette Basin Project.

4.4 Contracting Authority

As discussed above, the USBOR issues contracts for water held in federal reservoirs in the Willamette Basin, although the water can be used only for irrigation. USBOR has indicated that it does not serve as the contracting authority for M&I contracts for USACE storage projects. Consequently, a new contracting authority must be identified for M&I contracts from the Willamette Basin Project. It appears that the USACE could be the federal contracting entity for M&I and mitigation water. The USACE issues M&I contracts for other reservoirs, such as Lost Creek Reservoir in the Rogue River Basin Project. The next inquiry is with whom the USACE would contract. The various options, impediments, and opportunities are briefly summarized below.

Contracting with Municipalities

According to the USACE's Comprehensive Water Supply Study (IWR Report 01-PS-1), the USACE district office could process agreements directly with private users. While this may be feasible for a few users, the district has previously indicated that it is not administratively able to efficiently process a large number of requests for small amounts of M&I water.

Contracting with the State

The State of Kansas developed an MOU with the federal government for sale of water supply storage from USACE reservoirs to the state. The Kansas model could be adapted to work in Oregon. The MOU was intended to solve a host of problems associated with water quality, minimum flows, and water supply, as well as increasing economic benefits from the USACE reservoirs, increasing the level of recovery of past federal investments in water resources development, and increasing the level of dependable water supplies to meet the needs of municipalities and industries in Kansas.

Under the Kansas MOU, studies were to be conducted to determine if storage could be reallocated from water quality and other conservation purposes to water supply. Kansas would purchase reallocated storage to provide a more dependable water supply to downstream water users. Kansas' purchases would be financed from revenues from the Water Assurance Program (WAP). Under the WAP, water users in each district would have the authority to form an Assurance District that would provide M&I water supplies to users under low-flow conditions in return for payment associated with the cost of the storage space and the operation and maintenance expenses of such space incurred by the State of Kansas.

Legislation would be pursued, if necessary, to protect water quality releases in order to prevent water from being withdrawn for other purposes from releases made for water quality. The

USACE provided Kansas with a right of first refusal on all storage to be reallocated. The purchase price of stored water was to be considered as if it were authorized originally as M&I water supply storage, which deviated from standard procedures governing calculation of cost recovery requirements.

According to an OWRD memorandum, in the 1990s Oregon and the USACE tried to make an agreement for the Rogue River Basin, but the end user, a city without a municipal water system, did not appear to be capable of resolving key technical and financial issues. The memorandum noted that if Oregon and the USACE entered into an arrangement similar to the Kansas model, resolving technical issues necessary in a timely manner would be difficult and may remove local controls and financial options.

The Comprehensive Water Supply Study (IWR Report 01-PS-1) indicates that, for the remaining uncontracted water in the Willamette Basin project, OWRD could act as a purchasing agent for local water users. OWRD has previously indicated that it would need a more liberal escape clause in the water supply agreement if funding was not available because of the potential loss of a contract in any given year. One problem with having OWRD serve as a purchasing agent is that OWRD cannot fund the entire amount of storage and must rely on year-to-year funding either from the end user or the state legislature. Another problem is related to the basic storage concept as defined in the 1958 Water Supply Act (43 USC Sec. 390) as amended, and the corresponding Public Law 88-140 (43 USC sec. 390c-e) enacted in 1963. Public Law 88-140 provides for a permanent right to storage after the construction costs have been repaid. Storage agreements from originally authorized storage space are to be entered into under a permanent contractual arrangement, with the allocated costs of storage paid out over a period not to exceed 30 years. Thus, modifying storage agreements to include an escape clause or annual modifications may not conform to the legal requirements of storage agreements.

Oregon's Joint Task Force on Water Supply and Conservation's Report to the 2003 Legislature recommended facilitation of use of stored water in federal projects. In cases where the federal agency managing the project cannot enter into contracts with potential buyers of stored water, OWRD potentially could enter into an MOU with the federal agency and act as a broker of the stored water by acquiring a block of unused stored water. OWRD then could provide a source of supply to users that may not otherwise qualify to enter into a water contract with the federal government. OWRD should review its existing authority to determine if it can enter into such contracts with the federal government. If it concludes that additional authorization is required, the agency should work with the appropriate lawmakers and stakeholder groups to introduce and obtain support for necessary legislative changes.

Contracting with Third Parties

Rather than OWRD serving as a purchasing agent and broker of stored water, a third party could contract with the federal agencies for release of stored water for M&I uses. Multiple organizational options are available in the formation of a regional entity to serve this function. Further analysis would be required to select and create the best type of entity under Oregon law. Such entities may include the following:

- Water Authority Use formed under ORS 450

- Water District formed under ORS 264
- County Service District formed under ORS 451
- People's Utility District formed under ORS 261
- Intergovernmental Agreement formed under ORS 190

If the State of Oregon or some other entity organized under Oregon law acted as a broker for stored water for M&I use, the next question becomes how such water would be purchased. The broker could purchase a large block of water at the same time, although this may raise significant concern by irrigators who obtain water from USBOR. Another approach would be for the broker to wait to purchase specific amounts of stored water for M&I uses on an as-needed basis from individual water users. This approach would help minimize concerns that municipalities may buy too much stored water, and it would reduce budgetary and timeline concerns expressed by OWRD because the broker would not be purchasing large amounts of stored water all at once.

Possible Steps Forward

It appears that the USACE likely would issue the contracts for M&I water from the Willamette Basin Project. The question to be resolved then relates to whether the USACE would issue contracts directly to end users, to the state, or to other third parties. The following issues will need to be addressed to make progress on this issue:

- The municipalities will have to develop an assessment of the number of potential M&I contracts from federal storage that will be required. It is understood that this cannot occur until the cost of stored water for M&I has been established.

- After this estimated number is developed, the USACE will need to determine whether it can efficiently administer those contracts.

- If some type of intermediary is needed, the State of Oregon should investigate acting as an agent, somewhat akin to the Kansas model.

- The USACE could contract with OWRD or another broker that would purchase stored water for M&I uses on an as-needed basis on behalf of individual water users. This would help address OWRD's budgetary and timeline concerns associated with purchasing stored water. Further research and analysis would be needed to identify the specific type of entity to serve as the broker, should it be determined that one would be needed.

4.5 Conclusion

The section above describes several significant impediments to municipalities obtaining water from the Willamette Basin Project. Despite the complex nature of these impediments, there are

opportunities to surmount these obstacles. It is clearly recognized, however, that resolution of these issues will require efforts on the part of the municipalities, the State of Oregon, and the federal government. The following section provides recommendations for moving this process forward. The recommendations suggest opportunities for near-term solutions, as well as paths to address the longer-term issues discussed above.

Section 5. Summary and Recommendations

5.1 Summary

There appears to be no debate that Congress authorized the Willamette Basin Project for multiple purposes that include flood control, navigation, irrigation, flow augmentation, and water supply. The stored water from these reservoirs currently is being used for multiple purposes including irrigation, recreation, and flows to support ESA-listed fish. Stored water currently is not available for M&I purposes, despite water supply being an authorized purpose.

Municipalities are struggling to meet the existing demands and to plan for future demands by fully developing their existing water rights. New municipal water rights generally are not an option for numerous reasons, including water availability and restrictive basin program classifications. As a result, the policies and rules of the OWC have left the municipalities without options for ways to secure water supply and support Oregon's economic development.

We recognize there are many important uses of the stored water in the Willamette Basin Project, including support of listed fish (as provided in the recent BiOp), irrigation, and recreation. However, the projected municipal use of stored water would be minimal and should be supported as one of the multiple authorized uses of the reservoirs.

In response to this situation, the seven participating municipalities in the southern Willamette Basin have initiated this process in an effort to find a means to access water stored in the Willamette Basin Project. Initially, a small amount of stored water could meet these municipalities' water supply needs. If water stored in the Willamette Basin Project becomes available at a cost commensurate with other alternatives, these municipalities are anticipated to have an additional modest need (less than 2 percent of the total conservation storage) for this stored water by the year 2050. Supplying stored water to these municipalities will require resolution of the three major impediments discussed in Section 4: USBOR's water right; cost; and the appropriate contracting authority. The following discussions recommend approaches for the state and federal agencies to address these issues in the near term and long term.

5.2 Near-Term Recommended Actions

To provide the municipalities in the southern Willamette Basin an immediate opportunity to access stored water, the following steps could be taken to allow the use of water for mitigation purposes. Water for mitigation purposes could allow the municipalities access to other surface water and groundwater sources under state law. These proposed actions can be viewed as a pilot project that would provide a process to ensure that the participating entities can effectively fulfill their roles.

- USACE files a limited license application with OWRD for storage of 1,000 acre-feet of water in Project reservoirs for a five-year period. The application identifies the uses of stored water to be all of the authorized uses for the reservoirs.

- USACE concludes that it can issue a contract to a municipality for flow augmentation purposes to be used for mitigation purposes, based on the authorized purposes for that reservoir and the purposes for which costs were allocated for that reservoir.

- USACE concludes that the cost for a flow augmentation contract is the original cost of storage plus the OMRR&R, which equates to approximately $189 per acre-foot.

- Alternatively, USACE issues short-term surplus water contracts for mitigation purposes. USACE would need to clarify the cost for such contracts.

- USACE concludes that it can efficiently administer up to five contracts for this stored water.

- USACE determines if the cost allocation for the original construction costs serve as the storage allocation for the Willamette Basin Project, which would require a reallocation to have M&I included as an allocated purpose.

- OWRD continues to provide a leadership role to encourage full participation by all of the parties, and to move the second phase of this process forward.

5.3 Long-Term Recommended Actions

Although the above-described actions will address the municipalities' immediate need for water for mitigation purposes, they do not address the municipalities' need for water for source redundancy and for additional direct supply. Consequently, the state and federal agencies also could initiate the following processes to resolve the above-described impediments on a long-term basis.

- The procedure described by USACE for transferring the existing storage certificates should be followed. Under this process, USACE indicated that it will request that the USBOR file a transfer application to change the uses for water right Certificates 72755 and 72756 to include all of the authorized purposes for the Willamette Basin Project reservoirs, and that USBOR and USACE would jointly hold the new certificate.

- USACE determines that allocation of the storage in the Willamette Basin Project has not occurred, and either issues contracts for uncommitted storage or allocates the storage to include all of the authorized uses, including M&I. If USACE fails to obtain authorization for this approach, it reallocates the storage to include all of the authorized uses.

- If USACE determines that it cannot efficiently manage the number of contracts requested to meet municipal water demands, or if USACE concludes that contracts will

be priced based on the current construction costs, OWRD confirms that it has the authority to enter into an agreement, similar to the Kansas MOU, with the USACE, or actively pursues the necessary legislative changes to obtain this authorization.

- OWRD and USACE enter into an agreement under which OWRD could administer the contracts for M&I water, as necessary.

- In the event reallocation is necessary, USACE bases the cost of this M&I water on the original cost of construction, as in the Kansas MOU.

- Municipalities request contracts from the USACE through the OWRD and obtain secondary water rights to use the stored water for municipal purposes.

- The State of Oregon continues to be engaged with this process. If municipalities fail to obtain access to federal stored water at an equitable cost and with the requisite level of certainty, the OWC should review and modify its policies and rules that currently direct municipalities to stored water as their only potential new water source.

5.4 Conclusion

The recommendations above provide both short-term and long-term actions for the federal and state agencies to provide M&I water from the Willamette Basin Project to municipalities. Some of these actions undoubtedly will involve coordination with other stakeholders in the basin and may be controversial. Nonetheless, the state and federal agencies should take the necessary actions so that municipal water use is no longer the only authorized purpose not receiving water (see process flow chart in Appendix 3).

APPENDIX 1

OWSCI Grant

EWEB Municipal Water Demands[1]

Months	Days in Month	2006		2007		2025		2050	
		Million Gallons	Gallons per capita per day	Million Gallons	Gallons per capita per day	Million Gallons	Gallons per capita per day	Million Gallons	Gallons per capita per day
1	31	552	120	551	116	785	118	922	118
2	28	496	119	498	116	708	117	831	117
3	31	537	117	561	118	781	117	918	117
4	30	567	127	585	127	820	127	963	127
5	31	914	198	835	175	1246	187	1464	187
6	30	1003	225	1164	252	1540	239	1810	239
7	31	1468	319	1407	295	2047	307	2405	307
8	31	1450	315	1316	276	1970	295	2315	295
9	30	1032	232	1060	230	1489	231	1749	231
10	31	771	167	599	126	978	147	1149	147
11	30	569	128	527	114	780	121	917	121
12	31	534	116	516	108	748	112	879	112
TOTAL	365	9894	182	9619	171	13892	177	16321	177
Population[2,3,and 4]			**148,595**		**153,690**		**215,093**		**252,689**
Maximum Month (million gallons per month)		**1468**		**1407**		**2047**		**2405**	
Average Day Maximum Month (million gallons per day)		**47**		**45**		**66**		**78**	

Notes:

1. Historical demand data for 2006 and 2007 obtained from water provider. Demand forecast data assumed average per capita demand from historical data and multiplied by future population projection by month. Historical and forecasted data is associated with city only customers and does not reflect water demands from wholesale customers.

2. Population for 2006 and 2007 was obtained from Portland State University.

3. Population for 2025 is from Report on Lane County Coordinated Population Forecast 2025-2030 (February 2005).

4. Population for 2050 obtained from Region 2050: Southern Willamette Valley Regional Growth Management Strategy, Draft June 29, 2006, Lane Council of Governments.

OWSCI Grant

SUB Municipal Water Demands[1]

Months	Days in Month	2006		2007		2025		2050	
		Million Gallons	Gallons per capita per day	Million Gallons	Gallons per capita per day	Million Gallons	Gallons per capita per day	Million Gallons	Gallons per capita per day
1	31	264	149	255	144	374	147	509	147
2	28	240	150	228	142	337	146	459	146
3	31	231	131	252	142	349	136	474	136
4	30	259	151	240	140	360	146	490	146
5	31	310	175	279	157	424	166	577	166
6	30	297	174	378	220	486	197	662	197
7	31	515	291	466	262	707	277	962	277
8	31	516	292	429	241	681	267	926	267
9	30	373	218	381	221	543	220	739	220
10	31	290	164	269	151	403	158	548	158
11	30	236	138	244	142	346	140	471	140
12	31	254	144	211	119	335	131	456	131
TOTAL	365	3787	182	3633	174	5346	178	7272	178
Population[2,3,and 4]			**57,065**		**57,320**		**82,408**		**112,103**
Maximum Month (million gallons per month)		**516**		**466**		**707**		**962**	
Average Day Maximum Month (million gallons per day)		**17**		**15**		**23**		**31**	

Notes:

1. Historical demand data for 2006 and 2007 obtained from water provider. Demand forecast data assumed average per capita demand from historical data and multiplied by future population projection by month. Historical and forecasted data is associated with city only customers and does not reflect water demands from wholesale customers.

2. Population for 2006 and 2007 was obtained from Portland State University.

3. Population for 2025 is from Report on Lane County Coordinated Population Forecast 2025-2030 (February 2005).

4. Population for 2050 obtained from Region 2050: Southern Willamette Valley Regional Growth Management Strategy, Draft June 29, 2006, Lane Council of Governments.

OWSCI Grant
Creswell Municipal Water Demands[1]

Months	Days in Month	2006		2007		2025		2050	
		Million Gallons	Gallons per capita per day	Million Gallons	Gallons per capita per day	Million Gallons	Gallons per capita per day	Million Gallons	Gallons per capita per day
1	31	27	191	21	143	38	167	77	167
2	28	22	172	18	140	32	156	65	156
3	31	23	164	20	139	34	152	70	152
4	30	23	167	19	133	33	150	67	150
5	31	31	222	25	176	45	199	92	199
6	30	36	267	30	218	53	243	109	243
7	31	48	347	38	261	69	304	141	304
8	31	48	342	32	220	64	281	130	281
9	30	33	247	27	191	48	219	98	219
10	31	24	173	19	130	34	152	70	152
11	30	20	149	17	125	30	137	61	137
12	31	19	139	20	135	31	137	63	137
TOTAL	365	354	215	285	173	518	194	1044	194
Population[2,3,and 4]			**4,500**		**4,650**		**7,300**		**14,920**
Maximum Month (million gallons per month)		**48**		**38**		**69**		**141**	
Average Day Maximum Month (million gallons per day)		**1.6**		**1.2**		**2.2**		**4.5**	

Notes:

1. Historical demand data for 2006 and 2007 obtained from water provider. Demand forecast data assumed average per capita demand from historical data and multiplied by future population projection by month.

2. Population for 2006 and 2007 was obtained from Portland State University.

3. Population for 2025 is from Report on Lane County Coordinated Population Forecast 2025-2030 (February 2005).

4. Population for 2050 obtained from Region 2050: Southern Willamette Valley Regional Growth Management Strategy, Draft June 29, 2006, Lane Council of Governments.

OWSCI Grant

Junction City Municipal Water Demands[1]

Months	Days in Month	2006		2007		2025		2050	
		Million Gallons	Gallons per capita per day	Million Gallons	Gallons per capita per day	Million Gallons	Gallons per capita per day	Million Gallons	Gallons per capita per day
1	31	23	151	12	76	40	113	66	113
2	28	12	83	14	98	29	91	48	91
3	31	19	125	9	59	33	92	54	92
4	30	14	96	13	86	31	91	51	91
5	31	18	115	16	99	38	107	62	107
6	30	17	116	22	145	45	130	73	130
7	31	33	217	33	205	75	211	122	211
8	31	37	242	31	192	77	217	126	217
9	30	31	206	28	181	67	194	109	194
10	31	18	116	24	150	47	133	77	133
11	30	13	90	13	84	30	87	49	87
12	31	12	76	12	77	27	76	44	76
TOTAL	365	248	137	227	125	548	131	882	131
Population[2,3,and 4]			**4,965**		**5,135**		**11,477**		**18,748**
Maximum Month (million gallons per month)		**37**		**33**		**77**		**126**	
Average Day Maximum Month (million gallons per day)		**1.2**		**1.1**		**2.5**		**4.1**	

Notes:

1. Historical demand data for 2006 and 2007 obtained from water provider. Demand forecast data assumed average per capita demand from historical data and multiplied by future population projection by month.

2. Population for 2006 and 2007 was obtained from Portland State University.

3. Population obtained from draft 2008 Water System Master Plan, Junction City.

4. Population obtained from draft 2008 Water System Master Plan, Junction City.

Adopted Projections		Forecasted (w/o prison)		Forecasted (w/prison)	
2008	2030	2025	2050	2025	2050
5,736	9,800	8,677	15,948	11,477	18,748
Exp. Growth Rate (2008 to 2030)					
0.0243464					

11/14/2008

OWSCI Grant

Veneta Municipal Water Demands[1]

Months	Days in Month	2006		2007		2025		2050	
		Million Gallons	Gallons per capita per day	Million Gallons	Gallons per capita per day	Million Gallons	Gallons per capita per day	Million Gallons	Gallons per capita per day
1	31	12	91	14	96	24	93	61	93
2	28	12	100	13	97	23	99	58	99
3	31	13	100	17	115	28	108	70	108
4	30	13	103	17	125	29	114	72	114
5	31	24	186	23	159	45	172	112	172
6	30	23	183	32	227	52	205	129	205
7	31	37	280	36	251	70	266	173	266
8	31	37	282	37	255	70	268	175	268
9	30	26	208	30	217	54	212	134	212
10	31	20	152	15	103	34	128	83	128
11	30	13	104	14	102	26	103	65	103
12	31	15	111	16	111	29	111	73	111
TOTAL	365	246	159	263	170	508	164	1206	164
Population[2,3,and 4]			**4,240**		**4,640**		**8,468**		**21,038**
Maximum Month (million gallons per month)		**37**		**37**		**70**		**175**	
Average Day Maximum Month (million gallons per day)		**1.2**		**1.2**		**2.3**		**5.6**	

Notes:

1. Historical demand data for 2006 and 2007 obtained from water provider. Demand forecast data assumed average per capita demand from historical data and multiplied by future population projection by month.

2. Population for 2006 and 2007 was obtained from Portland State University.

3. Population obtained from draft 2008 Water System Master Plan, Veneta.

4. Population obtained from draft 2008 Water System Master Plan, Veneta

Adopted Projections		Forecasted	
2006	2030	2025	2050
4,240	10,158	8,468	21,038
Exp. Growth Rate (2006 to 2030)			
0.0364041			

OWSCI Grant

Corvallis Municipal Water Demands[1]

Months	Days in Month	2006		2007		2025		2050	
		Million Gallons	Gallons per capita per day	Million Gallons	Gallons per capita per day	Million Gallons	Gallons per capita per day	Million Gallons	Gallons per capita per day
1	31	169	101	185	108	207	105	259	105
2	28	157	104	163	106	188	105	235	105
3	31	171	102	174	102	202	102	253	102
4	30	168	104	168	102	197	103	246	103
5	31	246	147	217	128	272	137	340	137
6	30	273	169	312	190	343	179	429	179
7	31	382	229	374	220	444	224	555	224
8	31	362	216	353	208	419	212	524	212
9	30	289	179	289	175	339	177	423	177
10	31	223	133	190	112	242	122	302	122
11	30	180	111	176	107	209	109	261	109
12	31	176	105	160	94	197	100	246	100
TOTAL	365	2794	142	2760	140	3288	141	4072	141
Population[2,3,and 4]			53,900		54,890		63,811		79,739
Maximum Month (million gallons per month)		**382**		**374**		**444**		**555**	
Average Day Maximum Month (million gallons per day)		**12.3**		**12.1**		**14.3**		**17.9**	

Notes:

1. Historical demand data for 2006 and 2007 obtained from water provider. Demand forecast data assumed average per capita demand from historical data and multiplied by future population projection by month.

2. Population for 2006 and 2007 was obtained from Portland State University.

3. Population for 2025 is based on the growth rate assumptions contained in the Benton County Year 2020 Population Projection dated September 11, 1998.

4. Population for 2050 is based on the growth rate assumptions contained in the Benton County Year 2020 Population Projection dated September 11, 1998.

Adopted Projections		Forecasted	
1996	2020	2025	2050
49,275	61,029	63,811	79,739
Exp. Growth Rate (1996 to 2020)			
0.0089138			

OWSCI Grant

Monroe Municipal Water Demands[1]

Months	Days in Month	2006		2007		2025		2050	
		Million Gallons	Gallons per capita per day	Million Gallons	Gallons per capita per day	Million Gallons	Gallons per capita per day	Million Gallons	Gallons per capita per day
1	31	2.10	111	2.34	121	3.73	116	7.05	116
2	28	1.76	103	1.81	104	3.00	103	5.67	103
3	31	1.95	103	2.14	110	3.43	107	6.50	107
4	30	1.64	90	1.93	103	2.99	96	5.66	96
5	31	1.84	97	2.04	105	3.26	101	6.16	101
6	30	1.94	106	3.18	170	4.29	138	8.13	138
7	31	2.30	122	2.80	144	4.28	133	8.09	133
8	31	2.17	115	2.98	154	4.32	134	8.17	134
9	30	1.85	101	2.62	140	3.75	120	7.09	120
10	31	2.03	108	2.90	150	4.13	129	7.82	129
11	30	1.70	93	2.02	108	3.12	100	5.91	100
12	31	1.98	105	1.64	85	3.05	95	5.76	95
TOTAL	365	23	104	28	128	44	116	82	116
Population[2,3,and 4]			**610**		**625**		**1,037**		**1,962**
Maximum Month (million gallons per month)		**2.3**		**3.2**		**4.3**		**8.2**	
Average Day Maximum Month (million gallons per day)		**0.07**		**0.10**		**0.14**		**0.26**	

Notes:

1. Historical demand data for 2006 and 2007 obtained from water provider. Demand forecast data assumed average per capita demand from historical data and multiplied by future population projection by month.

2. Population for 2006 and 2007 was obtained from Portland State University.

3. Population for 2025 is based on the growth rate assumptions contained in the Benton County Year 2020 Population Projection dated September 11, 1998.

4. Population for 2050 is based on the growth rate assumptions contained in the Benton County Year 2020 Population Projection dated September 11, 1998.

Adopted Projections		Forecasted	
1996	2020	2025	2050
495	913	1,037	1,962
Exp. Growth Rate (1996 to 2020)			
0.0255074			

OWSCI Grant
TOTAL Municipal Water Demands[1]

Months	Days in Month	2006		2007		2025		2050	
		Million Gallons	Gallons per capita per day	Million Gallons	Gallons per capita per day	Million Gallons	Gallons per capita per day	Million Gallons	Gallons per capita per day
1	31	1049	124	1040	119	1473	122	1902	122
2	28	940	123	936	119	1320	121	1701	121
3	31	997	117	1035	119	1431	118	1845	119
4	30	1046	127	1045	124	1473	126	1895	126
5	31	1545	182	1397	160	2073	172	2653	171
6	30	1652	201	1942	230	2524	216	3219	214
7	31	2487	293	2356	271	3416	283	4366	281
8	31	2452	289	2200	253	3286	272	4204	271
9	30	1787	217	1816	215	2543	218	3259	217
10	31	1348	159	1119	128	1742	144	2237	144
11	30	1033	126	994	118	1424	122	1829	122
12	31	1012	119	937	108	1371	113	1767	114
TOTAL	**365**	**17346**	**174**	**16815**	**164**	**24076**	**169**	**30878**	**168**
Population[2,3,and 4]			**273,875**		**280,950**		**389,592**		**501,200**
Maximum Month (million gallons per month)		**2500**		**2400**		**3400**		**4400**	
Average Day Maximum Month (million gallons per day)		**80**		**80**		**110**		**140**	
Total Baseline Municipal Water Demand (Acre feet annually)		**53000**		**52000**		**74000**		**95000**	
Forecasted total municipal water demand with minus 20% confidence bracket (Acre feet annually)						**59000**		**76000**	
Forecasted total municipal water demand with plus 20% confidence bracket (Acre feet annually)						**89000**		**114000**	
Forecasted total municipal water demand with plus 20% confidence bracket minus current (2007) water demand (Acre feet annually)						**7000**	**37000**	**24000**	**62000**
Existing water supplies and new water supplies from ground and surface water resources may meet up to 50% of the projected new water demand (Acre feet annually)						**3500**	**18500**	**12000**	**31000**

Notes:

1. Historical demand data for 2006 and 2007 obtained from water provider. Demand forecast data assumed average per capita demand from historical data and multiplied by future population projection by month.

2. Population for 2006 and 2007 was obtained from Portland State University.

3. Population for 2025 is based on the growth rate assumptions contained in the Benton County Year 2020 Population Projection dated September 11, 1998 and for Lane County on the Coordinated Population Forecast 2025-2030 (February 2005), Veneta and Junction City from draft 2008 Water Master Plans

4. Population for 2050 is based on the growth rate assumptions contained in the Benton County Year 2020 Population Projection dated September 11, 1998 and from Lane County Cities on Region 2050: Southern Willamette Valley Regional Growth Management Strategy, Draft June 29, 2006, Lane Council of Governments. For Veneta and Junction City, projections were based on draft 2008 Water System Master Plans.

APPENDIX 2

Appendix 2

WILLAMETTE RIVER BASIN PROJECT - TOTAL USABLE STORAGE

COST/ACRE-FOOT ADJUSTED TO CURRENT PRICE LEVELS

Feb-99

Updated to 1999

Project	Total Storage Full Pool (Acre-feet)	Total Exempt Storage * (Acre-feet)	Total Usable Storage (Acre-feet)	Const. Period	Mid-point of Const.	ENR Index Const. mid-point	ENR Index factor to 1967	Initial Const. Cost (Joint-Use)	Indexed Costs - 1999 ** Total	Indexed Costs - 1999 ** Acre-foot
Blue River	89,520	3,970	85,550	4/63 - 2/69	3/66	1019	1.054	$28,729,730	$150,960,037	$1,765
Cottage Grove	32,930	3,140	29,790	8/40 - 12/49	4/45	308	3.487	2,276,000	$39,634,411	1,330
Cougar	219,270	64,050	155,220	6/56 - 11/63	2/60	824	1.303	49,393,000	$320,668,344	2,066
Detroit	472,600	154,400	318,200	1/47 - 10/53	5/50	510	2.106	41,405,200	435,731,300	1,369
Dorena	77,600	7,090	70,510	6/41 - 10/52	2/47	413	2.6	13,373,000	173,606,929	2,462
Fall Creek	125,000	10,000	115,000	4/62 - 12/65	1/64	936	1.147	20,099,700	114,960,584	1,000
Fern Ridge	111,434	8,300	103,134	4/40 - 12/41	2/41	258	4.163	2,296,000	47,847,836	464
Foster	60,700	31,100	29,600	6/61 - 6/67	6/64	936	1.147	18,669,000	107,048,233	3,616
Green Peter	430,000	160,000	270,000	6/61 - 6/67	6/64	936	1.147	46,012,000	262,938,795	974
Hills Creek	356,000	156,000	200,000	5/56 - 6/63	11/59	797	1.348	39,185,900	264,232,136	1,321
Lookout Point	477,700	118,800	358,900	4/47 - 7/54	1/50	510	2.106	65,793,500	700,056,676	1,951
Total	2,452,754	716,850	1,735,904					$327,233,030	$2,617,685,282	
						Ave cost per acre-foot - Usable Storage		$189	$1,508	

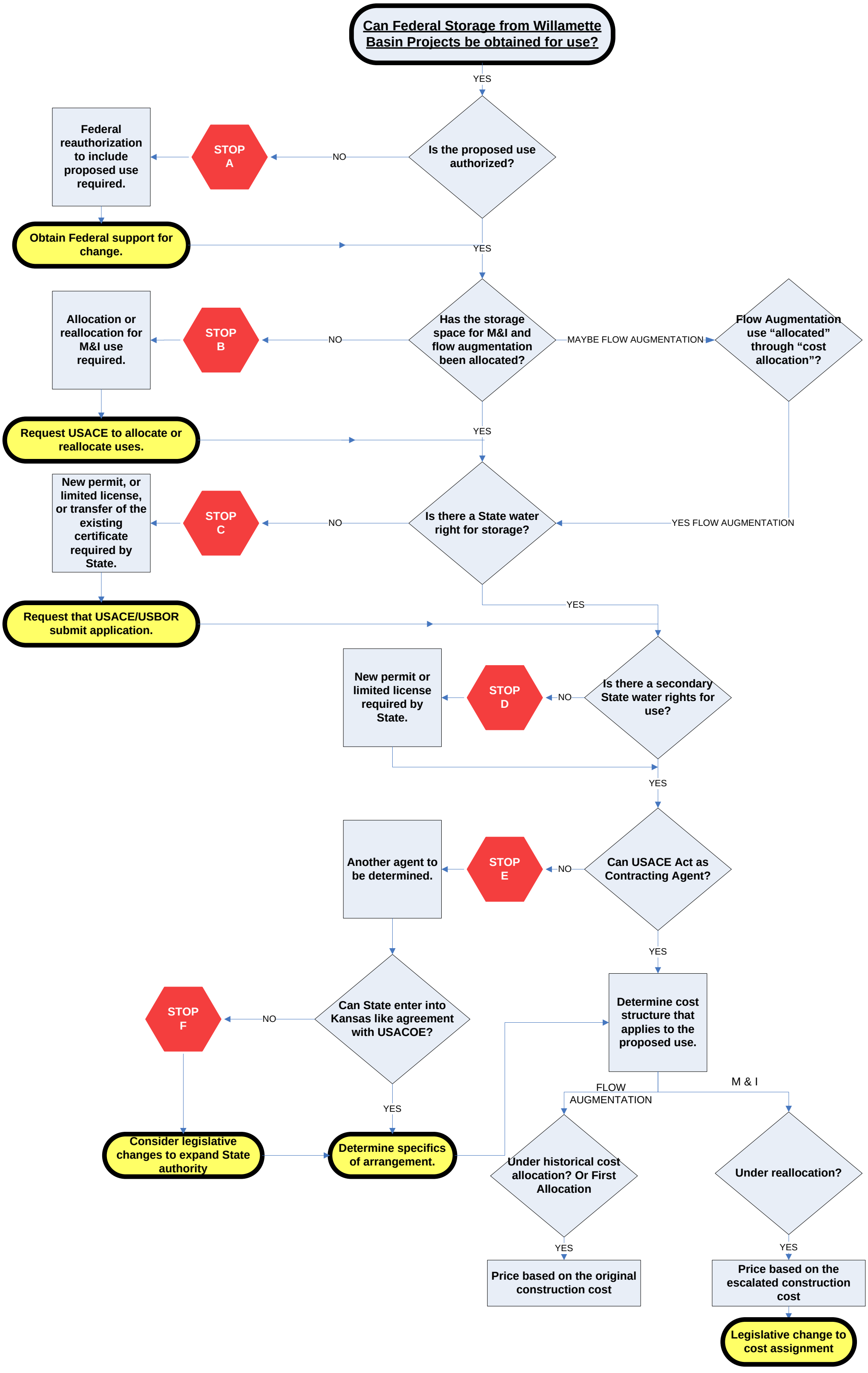
* Dead or inactive storage + storage for hydropower head.

** CWCCIS Index applied 1967 - 1999

Note: Estimated 100-Yr sediment volume assumed to impact only dead or inactive storage space, except at Fern Ridge Lake. (1,300 AF)

FY 1999 Water Supply Interest Rate Applicable to Reallocated Storage and Surplus Water Contracts: 5.375%.

APPENDIX 3


Can Federal Storage from Willamette Basin Projects be obtained for use?
YES
Is the proposed use authorized?
NO
STOP A
Federal reauthorization to include proposed use required.
Obtain Federal support for change.
YES
Has the storage space for M&I and flow augmentation been allocated?
NO
STOP B
Allocation or reallocation for M&I use required.
Request USACE to allocate or reallocate uses.
MAYBE FLOW AUGMENTATION
Flow Augmentation use "allocated" through "cost allocation"?
YES
Is there a State water right for storage?
NO
STOP C
New permit, or limited license, or transfer of the existing certificate required by State.
Request that USACE/USBOR submit application.
YES FLOW AUGMENTATION
YES
Is there a secondary State water rights for use?
NO
STOP D
New permit or limited license required by State.
YES
Can USACE Act as Contracting Agent?
NO
STOP E
Another agent to be determined.
YES
Can State enter into Kansas like agreement with USACOE?
NO
STOP F
Consider legislative changes to expand State authority
YES
Determine specifics of arrangement.
Determine cost structure that applies to the proposed use.
FLOW AUGMENTATION
M & I
Under historical cost allocation? Or First Allocation
YES
Price based on the original construction cost
Under reallocation?
YES
Price based on the escalated construction cost
Legislative change to cost assignment

GSI
Water Solutions, Inc.