Implementation of the Joint Operations Plan

Overcoming Political Challenges to Rational Management of Water Resources

in the Clackamas River Basin

Carol Bryck

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Executive Master of Public Administration

Portland State University

Advisor: Dr. Craig Shinn
Abstract:

The proliferation of local governments over the past fifty years has been astounding. Special Districts have been the most prolific, as school districts have consolidated and even some cities have gone into bankruptcy. Special Districts by their nature tend to be similar to regional monopolies and are often managed as if they were in competition with other entities.

In July 2001 three water providers in Clackamas County entered into an intergovernmental agreement (IGA) referred to as the Joint Operations Plan (JOP). Initially the objective was to share costs of pipeline construction connecting the North Clackamas County Water Commission (NCCWC) with the South Fork Water Board (SFWB) water treatment plants. The pipeline would enable the entities to obtain water from the other plant in case of emergency or unexpected shut down. Clackamas River Water (CRW) approached the other entities and asked for a seat at the table and agreed to fund one third of the cost of the pipeline, known as “Alignment B”.

The Joint Operations Plan also called for the appointment of a water master to oversee the distribution of water among the entities. These aspects of the JOP have not been fully implemented in over ten years, due in large part to concerns that individual entities might lose some autonomy to the other providers. This project will analyze the leadership challenges to implementation of the JOP and look for acceptable protocols for implementation that allow for effective and efficient use of the resource without diminishing the sovereignty of the individual entities.
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Chapter I

Introduction and Background of the Joint Operations Plan

Introduction

The Clackamas River is a source of clean water for over 200,000 residents of Clackamas County and parts of Washington and Marion County, Oregon. The Oregon Water Resource Division (OWRD) is responsible for permitting water rights throughout Oregon, and Clackamas River water rights have been permitted to several water providers, including Clackamas River Water (CRW), North Clackamas County Water Commission (NCCWC), South Fork Water Board (SFWB), the City of Oregon City, the City of Estacada, and the City of Lake Oswego.

OWRD has issued permits that potentially exceed Clackamas River flows during the warm summer months. In addition to allocating surface water for human consumption, OWRD rights define a minimum level of water flow to ensure mandated habitat for fish. Historically, water providers have not been highly cooperative, but have fended for themselves, tending their own silos with regard to water rights, access to water resources, treatment facilities, distribution infrastructure, and administration.

In July 2001, CRW, NCCWC, and SFWB signed the Joint Operations Plan (JOP) and collectively funded a 24-inch water pipe known as Alignment B, to connect the NCCWC water treatment plant with the SFWB water treatment plant. The JOP included many other provisions in addition to the pipeline construction; such as water supply agreements among the entities, and selection of a JOP Coordinator to develop annual water supply and exchange plans for all three entities.
Description of Project – Implementation

CRW, NCCWC, and SFWB signed the JOP twelve years ago; however the plan has never been implemented. The JOP followed the Intergovernmental agreement among the three entities to construct and equally share the cost of a water transmission line. The intent was to provide mutual benefit to CRW, NCCWC, and SFWB by construction of a connection between the SFWB and NCCWC water treatment plants. Total construction cost was nearly $2,300,000 shared equally by the three parties. Alignment B has been used to the benefit of all parties on an emergency or as needed basis. Water was effectively moved from NCCWC to SFWB for distribution to Oregon City and CRW South service area customers during expansion of the SFWB clear well in 2008 and 2009 and was moved the opposite direction when NCCWC had problems with the treatment plant filtration systems.

Organizational Structure of the Parties Involved

The three entities are organized under different governmental structures as prescribed by Oregon Revised Statutes. Domestic Water Supply Districts are under ORS 264 and cooperative organizations among more than one governmental entity are organized under ORS 190. An ORS 190 entity provides for cooperation of governmental units. The definition of ORS 190 is a unit of local government that includes a county, city, district, or other public corporation, commission, authority or entity organized and existing under statute or city or county charter (Oregon Laws, 2011). The entities participating in the ORS 190 are municipal corporations for SFWB and the entities that participate in NCCWC include a municipal corporation, a Water Authority under ORS 450, and a Domestic Water Supply District under ORS 264.

Clackamas River Water (CRW), a special district under ORS 264, is the sole owner of a water treatment plant with a firm capacity of 24 million gallons per day (MGD). CRW produces
water for nearly 13,000 retail accounts, approximately 50,000 residents, and also sells water to Sunrise Water Authority (SWA) on a wholesale basis. The CRW plant is currently operating at an average daily capacity of 8.5 MGD. The CRW district boundaries include significant large commercial and industrial customers, urbanized neighborhoods in unincorporated Clackamas County, and larger rural properties, particularly in the south service area.

North Clackamas County Water Commission (NCCWC) is set up as an ORS 190 entity, a water treatment plant jointly owned and operated by Sunrise Water Authority (SWA) at 48%, Oak Lodge Water District (OLWD) at 42%, and the City of Gladstone at 10%. The water treatment plant uses a slow sand filter (10 MGD capacity) and membrane filter process (10 MGD capacity, added in 2005). The slow sand component is off-line when turbidity (particles in the river) is high during the winter. The membrane filter can be limited to 8 MGD in the winter as well when temperatures fall. NCCWC has also had difficulties with membrane functions, limiting their production capacity.

NCCWC provides water on a cost-sharing basis determined by a prorated share of water production. The cost sharing is determined first by percentage ownership of the plant and then by water volume each entity is projecting. At the end of the year costs are recalculated and a true-up payment is assessed if usage is lower than predicted. The City of Gladstone, a municipal corporation, supplies water to approximately 11,700 residents with 3,500 utility accounts. OLWD serves approximately 27,000 residents through just over 8,000 active accounts in urbanized neighborhoods within unincorporated Clackamas County. SWA provides water to an estimated population of 30,000 through 12,500 active accounts, primarily urbanized unincorporated neighborhoods, but also the populations of the City of Damascus and the City of
Happy Valley. SWA purchases 1.5 MGD of water from CRW on a wholesale basis to supplement their share of the NCCWC water supply.

The South Fork Water Board (SFWB) is jointly owned by Oregon City and West Linn; organized under ORS 190. Both cities are municipal corporations under Oregon law. SFWB provides drinking water for the cities through the water treatment plant located in Oregon City constructed in 1958. SFWB is also the water provider on a wholesale basis to CRW for their South service area (south of the Clackamas River). The SFWB water treatment plant has a firm capacity of 18 million gallons per day (MGD) and has been able to operate at a peak day demand capacity of 21.3 MGD for brief periods. A proposed expansion of the pipeline from the water intake to the treatment plant would increase the capacity to approximately 25 MGD.

The population of Oregon City is 32,000 and the city manages 10,000 active utility accounts. The City of West Linn’s population is approximately 25,500 and provides utility services to approximately 8,500 water utility accounts. The population served via wholesale distribution of an average of 1.25 MGD to CRW customers is approximately 15,000 through 4,600 accounts.

**Area Demographics**

The population in Clackamas County is over 380,000 with approximately 170,000 served by the three plants, nearly 45% of the total county population. The balance of the Clackamas county population is served either through cities not provided for by the three entities, such as Lake Oswego, Milwaukie, Canby, Sandy, Boring, and Estacada, or with private wells on rural properties.

Using the county’s population forecast through 2030 the countywide population is expected to increase by 133,000 through 2030. The impact within the water providers’ territories
is estimated to increase at a slower rate due to the rural nature of much of the territory and the land use restrictions imposed. Even with increases in population, overall water demands per capita have decreased over the past ten years for a variety of reasons (FCS Group):

- Economic – recession
- Demographic
  - Declining household size
  - Densification (smaller lot sizes)
- Conservation
  - Imposed – Building code requirements
  - Improved – technology/efficiencies
  - Incentivized – pricing
  - Informed – education

Reduction in water consumption is a good thing for society and for river habitats, but creates challenges for water providers. The infrastructure and personnel required to deliver a lesser volume of water is essentially the same required for delivery of pre-conservation quantities of water because the same treatment plants, pump stations, and pipe needs to be maintained. Since all entities bill their customers in a combination of a flat periodic rate and a metered consumption rate, revenues have fallen as customers have conserved. Customers are increasingly frustrated by conservation efforts being rewarded with higher rates.

Viewing water provision from a broader regional perspective may reduce overall costs and therefore limit future rate increases to individuals. The question is, “How can separate independent governmental agencies work together to provide services in the most efficient and effective way possible?”
Importance of this Project

The JOP only addresses water supply agreements among the three parties, to accommodate emergency or unusually high periods of demand that may not be easily met by operation of the respective plants individually. The JOP could be expanded to encompass a broader view of the region and the resources available, specifically capital assets, such as the water treatment plants themselves. This broader view could delay capital improvements and expansion of any of the plants until the entire system nears capacity. All parties would benefit as expansion of the water treatment plants is estimated to cost $2 to $5 per gallon of water produced per day. The CRW plant is currently operating below 40% of capacity while SFWB and NCCWC are nearing capacity. The value of the excess capacity at CRW ranges from $31 million to $77 million in delayed construction cost for capacity, which translates to approximately $8 per month per capita of the population served by the three treatment plants.

Based on approval of the JOP in 2001 without full implementation, it is appropriate to explore the political and governance factors that have caused the delay. The JOP relied on existing water supply agreements, many of which have since expired or have been rewritten. Identifying mutual public benefit may encourage participation by all entities. Issues to be determined will include governance and development of trust in government itself, not only with the citizens but also among the entities.

Water is a precious resource and is not unlimited. Conservation, maintenance of the watershed, and water quality are all issues that must be considered as we move forward. People have been conserving water due to installation of more efficient fixtures and they have chosen to irrigate landscaped areas less. According to the Water Resource Foundation, homes built today use 30% less water than homes built ten years ago. This has caused a reduction in the volumes of
water that need to be produced in existing water treatment plants, but has also caused water
suppliers to increase rates. Water continues to be the least expensive commodity we buy, but as
rates climb it may become a hardship for some, specifically the poorest among us. From a
political standpoint, water rates can only go so high. As infrastructure ages it requires significant
financial resources to replace that may exceed the politically allowable maximums. The
American Water Works Association (AWWA) has estimated that nationwide water system
infrastructure requires investment of over $1 trillion over the next 25 years (Buried No Longer,
AWWA). Maintenance of the infrastructure is labor intensive. While at the same time the costs
of employee wages and benefits are also increasing.

The JOP with some modifications provides a mechanism to share costs, delay expensive
capital improvements and plant expansion. This mechanism is a way to ensure efficient use of
the resources. Determination of the efficient and effective use of the water resource by the
various parties will require development of an overarching policy for water use, memorandums
of understanding among the parties, and negotiation of a governance structure for the agreement.
The remaining regional players that may want to participate include the City of Lake Oswego,
with a water intake downstream of the three JOP participants, and the City of Milwaukie
currently supplying water to residents via wells.

Lake Oswego plans to increase their treatment capacity from 18 MGD to 38 MGD, vesting
the remainder of water permits held on the Clackamas River. This expansion is primarily to serve
the City of Tigard under a 2007 Intergovernmental Agreement (IGA), since Lake Oswego water
consumption has fallen from capacity to less than 13 MGD over the recent few years with the
imposition of tiered water rates to promote conservation. Construction is slated to begin in the
summer of 2013. Their design plans include modernizing the water treatment plant technology in addition to the increase in capacity.

The City of Milwaukie provides water to its residents from multiple wells. Milwaukie’s recently updated water master plan proposes drilling more wells to accommodate future water needs within the city. Much of the area adjacent to the City of Milwaukie within the urban growth boundary is currently within SWA or CRW’s district.

Coordination of resources and requirements on a regional basis has been a great challenge due to the sovereignty of special districts, authorities and joint entities such as NCCWC and SFWB. It will be critical to demonstrate the mutual benefit of shared resources to convince the various entities of the benefits of participation in the JOP. The governance issue must be carefully addressed to ensure that power, territory and responsibility of the individual entities are politically acceptable.

Implementation of the JOP is long overdue and will provide benefits across the region including more effective use of the water resources ensuring sufficient supply for human consumption, industrial and commercial needs, and environmental requirements of the watershed; reduced operating costs; more robust provision of water to customers; and more efficient application of financial resources for all of the participating entities.
Chapter II
Regional Water Resources, Water Rights, and Water Requirements

CRW, SFWB, NCCWC, Estacada, and the City of Lake Oswego all source their water from the Clackamas River. All face the same water resource limitations. Oregon Water Resources Department (OWRD) continues to approve water right permit renewal and expansion without adjusting for the mandated protections for fish habitat, therefore existing water permits on the Clackamas River potentially exceed the minimum water flow during summer months. Not all of the water rights that have been permitted are currently being used. Peak day requirements during the summer include agricultural, recreational and landscaping use, so curtailment of some uses may be required to meet river levels mandated for fish without inhibiting lifeline water for human consumption. Any cooperation developed will benefit the entire region from both economic and environmental perspectives.

The three water treatment facilities participating in the JOP have a current combined firm capacity of 60 MGD, with combined unused capacity of 38 MGD based on average day demand and 12.5 MGD based on peak day demand. NCCWC and SFWB approach their production capacity during hot summer days, while CRW has significant unused capacity. Each party is a separate jurisdiction providing water to customers within their designated boundaries.

Water Rights on the Clackamas River

The water available to the water providers in the region is the Clackamas River. Should there be a problem with that source of water none of the members would have an available alternative source. Securing alternative or emergency sources of water is a high priority for all participants in the JOP. South Fork manages the most senior water rights, followed by CRW. ORWD
Water Rights on the Clackamas

<table>
<thead>
<tr>
<th>Permit</th>
<th>Flow Rate</th>
<th>Date</th>
<th>Notes</th>
</tr>
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<tr>
<td>NCCWC</td>
<td>10 CFS</td>
<td>5/18/1994</td>
<td></td>
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<tr>
<td>Glad</td>
<td>9.73 CFS</td>
<td>1978 &amp; 1981</td>
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<tr>
<td>LO</td>
<td>9 CFS</td>
<td>7/5/1975</td>
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<tr>
<td>Estacada</td>
<td>2 CFS</td>
<td>1/19/1973</td>
<td></td>
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<tr>
<td>Oak Lodge</td>
<td>62 CFS</td>
<td>7/1/1970</td>
<td></td>
</tr>
<tr>
<td>CRW</td>
<td>6.5 CFS</td>
<td>5/25/1969</td>
<td></td>
</tr>
<tr>
<td>CRW</td>
<td>25 CFS</td>
<td>5/20/1968</td>
<td></td>
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<tr>
<td>OWRD</td>
<td>640 CFS</td>
<td>8/26/1968</td>
<td>This permit is an extension of OWRD's 1966 permit and is valid September - June</td>
</tr>
<tr>
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<td>50 CFS</td>
<td>3/14/1967</td>
<td></td>
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<tr>
<td>OWRD</td>
<td>400 CFS</td>
<td>5/25/1966</td>
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<tr>
<td>CRW</td>
<td>15 CFS</td>
<td>4/25/1962</td>
<td></td>
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<td>Estacada</td>
<td>2 CFS</td>
<td>8/10/1965</td>
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<tr>
<td>SFWB</td>
<td>60 CFS</td>
<td>8/31/1953</td>
<td></td>
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<tr>
<td>Glad</td>
<td>4 CFS</td>
<td>3/12/1951</td>
<td></td>
</tr>
<tr>
<td>OC &amp; WL</td>
<td>30 CFS</td>
<td>1926 &amp; 1931</td>
<td>These water rights are specifically for the upper Clackamas River, OC, WL, and SFWB do not currently have an instream to utilize these water rights.</td>
</tr>
<tr>
<td>OC</td>
<td>20 CFS</td>
<td>1/16/1918</td>
<td></td>
</tr>
<tr>
<td>SFWB</td>
<td>6 CFS</td>
<td>7/17/1914</td>
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</tbody>
</table>

Estimated AVERAGE Flow of the Clackamas River in September is 800 CFS

MINIMUM Allowable Flow of the Clackamas River in September 640 CFS

Box Sizes are NOT Proportional.

Figure 1

Revised 10/19/2010
controls the water rights on the river and has designated a minimum flow required for maintaining fish habitat. Water rights on the Clackamas River are shown in Chart 1. Should water levels fall too low OWRD could require curtailment by all permitted users. Curtailment events/orders may not respect the matter of who has the most senior water rights, but would likely be imposed evenly across all users.

Currently CRW is producing an average of 8.5 MGD of the firm capacity of 24 MGD to provide water for the North service area including 1.5 MGD to meet the needs of SWA. The following chart shows the capacity of the three water treatment plants, the average day demand, and the peak day demand.

![Individual Capacity and Demands](image)

**Figure 2**

The NCCWC maximum plant capacity of 20 MGD serves the 11,500 residents of Gladstone, the 27,000 customers of Oak Lodge Water District and a portion of the estimated 30,000 customers of Sunrise Water Authority. SWA purchases the remainder of their water needs from CRW.
SFWB has budgeted capital improvement to increase the pipeline between the intake and the water treatment plant that would increase production capacity up to 25 MGD. With the current slow growth and reduction in water consumption the SFWB plant should provide sufficient capacity through 2030.

Peak demand is unevenly distributed between the three plants. These numbers only look at average day demand (ADD), and peak day demand (PDD). Additionally water systems look at peak hour demand, which can exceed firm capacity of the plant. In the region peak hour demand is for a very short number of hours and peak day demand is usually only a few days a year.

When total capacity of the treatment plants is combined and then compared with average daily demand and peak day demand the picture is less severe, demonstrating that cooperation in the production and distribution among the JOP partners would provide significantly more capacity for current and future needs. The following graph highlights the greater availability of combined capacity versus “go it alone” for the three treatment plants.
Projections of water needs in the region are based on projected build out of Oregon City, Milwaukie, Happy Valley, Damascus, and Gladstone to the extent of the urban growth boundaries (UGB) surrounding their cities. Milwaukie and Gladstone are mentioned here, because their annexation of properties in the UGB would potentially take customers from CRW and add them to the customer base of the cities. The City of Happy Valley is not a water supplier. Citizens of the City of Happy Valley are individual customers within the service areas of SWA or CRW and purchase directly from those water providers. In some cases the cities do not have the capacity to serve the annexed area, so CRW or Oak Lodge could enter into intergovernmental agreements to allow for continued service. As water districts they are at risk of losing customers to annexation by the cities.

Metro, the regional government, designated areas as either urban or rural reserves. These designations received final approval in August 2011. The rural reserves are anticipated to remain at their current densities for the next 40 to 50 years. Considering areas within the UGB as well as those designated urban or rural reserve within Clackamas County total estimated population increases are projected of 145,000 through 2035 (Clackamas County Planning & Zoning Division, 2013). Of that number only about 15,000 are expected to be in the unincorporated urban area of the three JOP entities and approximately 8,000 in the rural unincorporated portion of the county, some of which is outside the water providers territories. Nearly 75,000 of the projected increase is expected to be within the cities of Clackamas County including West Linn, Oregon City, Lake Oswego, Milwaukie, and Gladstone (Clackamas County Planning & Zoning Division, 2013). The source of water to accommodate these needs is primarily from the Clackamas River. Milwaukie supplies water from wells within the City, but to accommodate additional needs they may need to look for other sources. Growth within the CRW district
boundaries is fairly limited, although there is the potential for industrial growth and that could mean significant demands on water depending on the industry. Another demand on the resource is the Lake Oswego – Tigard Water Partnership projecting an increase in plant capacity from 16 MGD to 38 MGD with 18 MGD allocated to the City of Tigard. Tigard growth rates are in Washington County and therefore are not estimated in the Clackamas County report.

Estimated combined future capacity for the five water treatment plant intakes along the Clackamas River is 110 MGD. This accounts for the members of the JOP and the City of Estacada and the City of Lake Oswego. This figure does not anticipate any expansion of the CRW, NCCWC, or Estacada treatment plants, but does include both the 22 MGD Lake Oswego plant expansion to serve Tigard and Lake Oswego growth and the 5 - 7 MGD expansion by SFWB included in their near term capital improvement plans. The SFWB increase in capacity is reasonable (rational) due to the age and condition of the intake pipeline and because the facility is already operating at capacity during peak use.

As the three entities look at their future requirements, it is time to reexamine and determine the best way to implement the JOP to the benefit of all customers in the region. As mentioned, adding up the potential water rights on the Clackamas River exceeds the available capacity of the river in the summer months. That is a critical time for fish habitat as well. Cooperation among the parties could preserve water flows for the habitat while continuing to provide for the needs of the citizens in the region.
Chapter III

Analysis of Other Regional Entities

Regional water management is not a new idea. Other areas have developed regional mechanisms for treating and delivering water. Small independent water companies are expensive to build and to operate. Economies of scale can prove valuable for delivery of water service within a region. In addition to water suppliers, governments have been cooperating in other areas. This cooperation is frequently organized as a special district, but there are joint cooperative forms of governance as well.

Florida Regional Water Management

The State of Florida has regionalized water system planning at the state level. The state determined that the regions should operate as administrators of water distribution rather than policy makers, leaving the policy role to state government. This includes resolution of statewide conflicts such as water rich versus water poor, urban versus rural, public versus agricultural use and coastal versus inland concerns (Matthews, 1997). Florida population growth has occurred in areas with insufficient water resources while water remains plentiful in many areas with less growth. As more water is withdrawn from the aquifer the water quality diminishes by encroachment of brackish water from the ocean and the gulf. The issues faced by Florida are very different form the issues in the Clackamas River Basin, although development of state policy over water management could ease the drive of individual special districts to maintain their jurisdictions to the detriment of the broader needs.

The implementation of the Florida Water Resources Act of 1972, creating five water management districts under the supervision of the Department of Environmental Protection (DEP) has evolved into a system of regional authority being held by the water management
districts rather than at the state level. Much of the benefit proposed and foreseen by the Water Resources Act patterned after the Model Water Code has not been realized (Christaldi, 1996). The 1997 Water Act clarified roles and enhanced district governance and continued to look for additional water resources.

**California Regional Water Control Boards**

The State Water Resources Control Board, created in 1967, sets statewide policy for water quality and coordinates with and supports the nine regional water quality control boards in California. The nine boards are geographically divided by basin for management of the water resources. The regional water boards are primarily responsible for water quality issues. As in Florida the overarching political responsibility is at the state level.

A more recent study was developed in California for an economic and engineering optimization model referred to as the California value integrated network (CALVIN). The purpose is to maximize the economic values of agricultural and urban water use (Draper, 2003). Some of the issues addressed by CALVIN are similar to the issues being analyzed in this report:

- Examine the potential for more flexible operations and allocations.
- Economic performance including evaluation of capacity alternatives and water transfers and estimation of user willingness to pay for additional supplies.
- New management options for water use and capacity expansion.

Again the state controlled model is vastly different from the models available in Oregon with Special Districts and ORS 190 organizations to combine the efforts and resources of multiple water suppliers. The State of Oregon specifically controls water quality in conjunction with Federal regulations, but doesn’t have authority to coordinate water distribution among water providers in the state.
The Joint Water Commission (JWC) in Washington County is an example of regional water cooperation and management in Oregon. The JWC is organized as an ORS 190 entity combining the water supply and distribution efforts of Tualatin Valley Water District (TVWD), the City of Hillsboro, the City of Forest Grove, and the City of Beaverton. The JWC is also a wholesale provider to the City of North Plains. The JWC provides water to over 400,000 residents in Washington County. As an ORS 190 entity, the JWC has employees and bills the participants for the appropriate share of services being provided. The City of Hillsboro manages the JWC partnership and all personnel are employees of the City of Hillsboro. The JWC develops an annual budget for costs to be shared by the participants.

The JWC has a 12 member board, three members from each agency, that meet quarterly to adopt the Budget, hear project updates and make policy and operations decisions for the Commission. The JWC also has three committees to oversee day-to-day operations. They are the Management Committee, the Operations Committee, and the Events and Education Committee.

Other regions have attempted a regionalization system for water providers. Development of a governance structure similar to this would further complicate a very complicated water supply system. South Fork Water Board provides treated water to the Cities of Oregon City and West Linn, and to CRW South Service area. CRW supplies water to the North service area from the CRW water treatment plant and also sells water wholesale to SWA. CRW also purchases water from SFWB for their customers south of the river. NCCWC sells water on a pro rata basis to SWA, Oak Lodge Water District and the City of Gladstone. SWA, an owner of NCCWC, purchases water from NCCWC and from CRW on a wholesale basis. The complexity of the JOP water provider relationships is as shown in figure 4:
The complexity of the water supply arrangements, and issues of expired formal agreements with no change in water supply for the various entities calls for a close review of the needs, the intents, and the interests of all the parties involved. CRW and SWA are beginning to negotiate shared service agreements, such as Geographic Information System (GIS), and laboratory services for water testing. The intent is to create another ORS 190 organization to provide for sharing of resources and certainty of water supply from CRW to SWA in order to delay expansion of the NCCWC plant at SWA’s expense.
It is clear that capital costs incurred by any one of the parties to expand a treatment plant are costs that will be born by all. The cost of treatment plant expansion by SFWB will require rates to go up for Oregon City, West Linn and CRW. If NCCWC expands their treatment plant rates will increase for Gladstone, Oak Lodge and Sunrise. This cost would also be passed onto SFWB (and their customers) when emergency situations require use of Alignment B. If CRW expanded their plant, the capital cost would be included in the wholesale rate charged to SWA. To benefit all parties, capital expansion should be delayed and water should be delivered from the most rational site to the location with the unmet need.

There are physical and operational challenges related to connections and capacities within the existing systems. There is currently no mechanism to move water from the CRW plant on the north side of the river to customers on the south side. Alternatives exist that would provide for sharing of resource in the most rational manner. The CRW treatment plant has sufficient capacity to supply water needs to SWA, Oak Lodge and the City of Gladstone and has installed pipelines to provide water service to those entities. Prior to the construction of NCCWC in 1999, CRW was the wholesale supplier to SWA, Gladstone and Oak Lodge. If CRW were to provide water to NCCWC customers, the NCCWC treatment plant would have capacity to provide water through Alignment B to the CRW customers in the south service area, freeing up SFWB water for the demands of Oregon City and West Linn.

CRW has space reserved on the Carver Bridge currently under construction for a water line to loop the system and provide water from the CRW treatment plant to a limited number of customers in the south service area. With additional capital improvements to the pipelines, more customers can be served from the CRW treatment plant, again freeing up capacity from the SFWB plant for Oregon City and West Linn demands in the future.
Comparing the entities and the area involved in the JOP with other governmental entities that have developed regional cooperation it is evident that it can happen. Looking beyond water, other resources are shared over broader regions. In Washington County, Oregon alone there is evidence of significant cooperation with contracting of fire service from Tualatin Valley Fire and Rescue (TVF&R). Fire service is expensive and much benefit is gained from economies of scale. Several cities contract for fire and emergency medical service from TVF&R rather than attempting to fund and operate a fire department within the city. Tualatin Valley Parks and Recreation and North Clackamas County Parks and Recreation are two other examples of shared service models, serving not only residents of cities within their physical territory but also residents of unincorporated county.
Chapter IV

Financial Analysis – Delay of Capital Spending on Water Treatment Plant

Using estimates of construction costs for capital improvements analysis can be performed on cost differences between a cooperative model of shared services and resources versus a go it alone model of the three entities. The current capacities of the water treatment plants have been described and the timing of significant improvements or expansion of individual assets is imminent without sharing. Cooperation and sharing of the assets and capacity of the system as proposed in the JOP could save significant dollars throughout the region.

Water treatment plant expansion costs can vary greatly depending on the extent of the expansion and whether or not water treatment technology improvements and upgrades are included. The City of Lake Oswego in partnership with the City of Tigard is proposing an expansion of the Lake Oswego water treatment plant to expand the plant’s capacity from 16 MGD to 38 MGD. The total cost of this project is estimated to be $252 million, but this includes design, legal fees, permits, a new raw water intake in Gladstone on the Clackamas River, a 42” raw water pipeline under the Willamette River, plant expansion, treatment upgrades to include ozone treatment system, reservoir expansion, and transmission mains from West Linn to the west side of Lake Oswego where water can be delivered to the Tigard water system. Total estimated cost of principal only is $15.75 per gallon; very high cost but includes all components of water treatment, storage and delivery for 22 MGD.

A general estimate for increased storage capacity, i.e. reservoirs, is around $1 per gallon of storage capacity. Cost of incremental conventional water treatment capacity is estimated at $2 to $5 per gallon. Changing to newer technology such as ozone treatment is on the higher end. For a pay-as-you-go strategy expanding the NCCWC plant by 5 MGD would cost each ratepayer an
estimated $167. When the average bill is approximately $25 per month that increased capacity calculates out to $14 per month or a 78% increase. Alternatively entering into a wholesale water agreement to obtain water from existing capacity in the basin could meet the same demands at a greatly reduced cost, closer to a $1 or $2 increase.

How long can the partners in the JOP delay system expansion? Due to the economic downturn from 2008 to the present, development has slowed and with it, population growth. This is helping to delay system expansion needs. Additionally, any new development in the system must meet current building codes including water saving devices within the homes. Per capita consumption estimates for the City of Seattle have gone from 109 gallons per day in 2002 to 95 gallons per day in 2008, a nearly 13% decrease (Dziegielwski & Kiefer, 2010). The climate in Seattle is similar to Clackamas River basin, so it is reasonable to think the per capita consumption here is close to the same. One difference to be aware of is the rural nature of much of the CRW territory and some of the SWA territory that could cause higher per capita consumption, as there is likely to be greater outdoor water use for landscaping. Alternatively higher density development also means smaller yards and therefore less landscape water usage. Conservation pricing, installation of efficient water fixtures, and an awareness of the need to conserve have all contributed to this change. In Clackamas County that equates to an estimated annual reduction of nearly 5 million gallons for the county as a whole. With maximum combined capacity of 60 MGD and current water consumption rates the three existing plants have sufficient capacity to provide water for the region with estimated build out of Oregon City and West Linn by 2030 and a doubling of residents in the Sunrise Water Authority. SWA includes Happy Valley, an area anticipated to continue with strong growth. The future of Damascus is unknown, awaiting results of voter input on disincorporation of the city. Growth in Gladstone and Oak
Lodge is expected to remain slow and development of land in the CRW territory of unincorporated Clackamas County is forecasted to be minimal. Potential industrial growth could impact demands within the CRW territory. When looking at individual entities the picture is not quite the same. All three plants should meet average day demand, but will run short when faced with peak day demand on hot summer days. Currently, the SFWB plant is nearing capacity most summers for a few days. NCCWC was approaching peak capacity in the summer, but demands in the past two years have dropped, most likely due to the economy forcing conservation.

With CRW firm treatment capacity of 24 MGD, the North service area is capable of accommodating significant growth before expansion would be needed. Currently the CRW plant is producing water for a population of approximately 65,000 between CRW north system customers and SWA customers. The population would need to double before the plant would need to be expanded. While that is not expected that to occur within the next 50 years, it does demonstrate that there is capacity to share in the region to delay capital investment in expansion. This does not mean that the water providers do not have any capital needs, it simply allows for capital to be spent replacing aging pipelines, and upgrading pump stations and reservoirs rather than expanding treatment plant capacity.

Current capital improvement projects for CRW include upgrading the electrical system at the water treatment plant for safety improvements and to accommodate an emergency generator to provide for power to operate the treatment plant in the event of a major power outage. SFWB is planning a capital project to increase size of the pipeline from their intake to the plant, which will effectively increase their treatment capacity by approximately 5 MGD. Limitations on production output can be imposed by various components of the treatment facility. In the case of
SFWB the volume of water from the river intake to the plant limits the current production capacity.

Capital improvements whether funded with or without debt have an impact on water rates. If operating on a pay as you go basis, water rates need to be sufficient to put aside significant dollars each year for future capital improvement projects. System Development Charges (SDCs) have been relied upon in the past to provide funding for large capital improvements that provide new capacity for the system, but with the economic downturn, SDC revenues have slowed to nearly zero and SDC reserve balances will run out before all the capital needs have been met. If incurring debt for capital projects, the rates still need to increase enough to meet bonded debt covenants as required by bondholders. Bondholders typically want revenue to exceed operating costs by at least the amount of principal and interest charged on the debt on an annual basis.

Delay of large capital expenditures will also delay large rate increases that have an impact on all customers. When the water providers use conservation rates, significant rate increases can change customer behavior and revenues may be directly impacted with reduction in water use.
Chapter V

Political Impetus – Benefit to Public

Comparison of rates between the entities

All the participants have different methods of charging for water, some with tiered rates to encourage conservation, others with a flat rate for any and all volumes consumed. There are significant variations in the percentage allocated to the base rate as well. The base rate provides stability in revenue versus reliance on consumption to generate sufficient revenue. Since water suppliers expenses are largely weighted to fixed costs it proves challenging to rely on variable streams of revenue to meet those needs. As many water providers have learned, when conservation pricing is used and rates increase significantly the more water is used, customers will change their behaviors and water consumption and therefore revenue will decrease.

CRW uses conservation pricing, charging for consumption at tiered rates with higher costs for greater usage, along with a base rate or meter charge. For use other than single family residential CRW employs a winter average rate calculation. This charges the commercial accounts one rate for up to 150% of the winter average use and any consumption in excess of 150% is charged at a higher rate. This is also conservation pricing essentially allowing for indoor use at one rate and outdoor (summertime) use at a higher rate. Many industrial customers never reach the higher rate as their consumption remains fairly even throughout the year. SWA and Oak Lodge also charge customers higher tiered rates for higher consumption. The City of West Linn and the City of Gladstone include a “lifeline” volume in the monthly base rate and charges a single rate for each unit of use in excess of the base. Oregon City also charges water consumption at a single rate for all volumes.
The lower portion of Figure 5 represents the fixed amount that is collected from an average customer every two months even when no water is used. Gladstone provides for 600 cubic feet of water per month in the base rate. The City of West Linn includes 700 cubic feet per month in the base rate. All other entities separate the base rate from the consumption portion. Including potential consumption in the base rate ensures stable cash flow, while charges for every cubit foot in addition to the base rate may encourage greater conservation. Water rates need to cover all components of delivering water that meets state and federal quality standards. The rates include operating and maintenance (O & M) costs, debt service, and a component for future capital improvements. A water provider must also have sufficient cash flow to cover capital outlay expenses such as vehicle or equipment replacement. The graph below shows monthly water costs for an average customer in the region with an estimated consumption of 800 cubic feet per month.

![Figure 5](image-url)
Gladstone, Sunrise and Oak Lodge all purchase their water from NCCWC, but you can see that the rates to their individual customers are very different. The same can be said for West Linn and Oregon City as customers of SFWB. Cost of wholesale water purchases, distribution system and degree of ongoing maintenance, debt, and administrative overhead all contribute to the cost of water delivery and must be accommodated in the water charges to end users. Some water providers consistently do ongoing maintenance and some run their systems to failure. This accounts for the varied rates charged when wholesale costs are similar.

Borrowing is a prudent way to cover the costs of capital projects, but water rates need to be sufficient to cover the cost of borrowing and provide cash flow for operations. Borrowing spreads the cost over current customers and future customers. Capital improvements typically are for assets that will outlive the term of the debt. For water providers with capital improvement needs, it is not a matter of a rate increase or debt; it is usually both.

Capital cost of 5 MGD plant expansion is estimated between $10 and $25 million, with an estimated annual debt payment between $704 thousand and $1.8 million, spread evenly to all retail and wholesale customers it is up to a $3 per month increase. The monthly impact would be much greater if attributed to only retail customers within a particular water provider’s territory. Implementation of the JOP can delay and/or reduce the amount of debt incurred by each individual entity, saving money for all parties in the long run.

Operational Savings

In addition to capital savings, implementation of the JOP provides streamlined operations where specific expertise available at one entity could be used by multiple entities. Personnel services are approximately 50% of the operating budget of the water providers in the region. CRW has a certified laboratory and could provide in-house water sample testing for all of the
participants. The CRW in-house testing is less expensive than external testing laboratories. All entities should have a Safety Coordinator to ensure compliance with OSHA requirements, but this is not a full-time requirement, so the expertise and services could be shared. CRW and SWA are currently sharing the expertise and the system for Graphic Information System (GIS) through a CRW employee. This provides revenue for CRW and savings to SWA. CRW uses the expertise of a SWA employee for governmental relations to monitor upcoming legislation at the state level. This provides revenue for SWA with cost savings for CRW. Other opportunities may exist for sharing highly technical and specialized expertise that could realize savings for all participants of the JOP.

**Cost of wheeling water versus wholesale purchases**

The term wheeling in the water industry refers to transferring water from one system to another charging for the cost to the system of moving the water. It does not include purchasing the water. It simply accounts for distribution through another system. Costs would include power for movement through pumping stations and wear and tear on the rest of the system in use. Wheeling also limits pipeline capacity such that it is unavailable to the host utility. A general estimate for wheeling costs would be 10% of base cost to produce water plus pumping costs of around $0.08 to $0.15 per hundred cubic feet of water. Calculations can be more specific based on system hydraulic modeling, pump stations and feet of pipe the water moves through.

**Sovereignty of individual entities**

A challenge for implementation of the JOP is the sovereignty of the individual water providers. The entities have not been willing to forego control over any of their assets or accept any responsibility for another’s liabilities. Providing assurance to the three entities that
implementation of the JOP would not require any transfer of assets or liabilities is crucial to acceptance of the plan.

There is a saying that “all the boys want to have their own train set” and that seems to have been the mindset of the participants in the JOP. This is an old model and needs to be revised. Cooperation among the three JOP partners has been achieved through membership in Clackamas River Water Providers (CRWP). CRWP provides jointly funded planning efforts, watershed management, and water conservation. All members fund CRWP projects through annual dues and all of the General Managers participate in the monthly meetings. Savings are achieved through sharing of resources and economies of scale (Clackamas River Water Providers). In addition to the JOP partners Estacada, Lake Oswego, and the City of Tigard are also members. Resources are limited; water, money, time; so sharing of resources can provide exponential benefit to the entire region.
Chapter VI

Leadership Framework for Development and Management of the Plan

Cooperation

The JOP was developed and agreed to as a method of cooperation among CRW, NCCWC, and SFWB. The initial decree was simply to implement water supply agreements between the three parties for operation and maintenance of a transmission main between the water treatment plants. The transmission main “Alignment B” does not connect to CRW. While CRW does not have direct access to “Alignment B”, it has provided water to the customers in the CRW South service area when the SFWB plant isn’t operational.

The initial goal for SFWB and NCCWC was construction of the pipeline to provide back-up water source in the event of a plant failure. Cooperation, other than funding, was not the priority. There was simply an IGA between the parties for the pipeline construction project. Based on the interaction and relationship among the parties during that time it is surprising that CRW was invited in, but they did have the $750,000 entry fee.

The plan identifies the supply responsibility of all parties, as has been addressed earlier in this report. Since the JOP was signed many of the water supply agreements have expired or been modified. CRW no longer provides wholesale water to the City of Gladstone (they have since purchased a 10% share of NCCWC), the City of Milwaukie (they have drilled additional wells and provide for their full requirements via the wells), or Rockwood PUD (they also rely upon wells for their water source).

The change in the water supply agreements can be traced to operational and political issues. The supply of water to Rockwood PUD was intended at the time to assist CRW in acquiring a designation as a water authority or a public utility district (PUD) so they would not
loose customers with annexations by adjacent cities. After much time and money the Authority status was denied and the water supply agreement with Rockwood was terminated.

Prior to the JOP, CRW was the water provider to all owners of the NCCWC, but political turmoil, particularly within the CRW Board of Commissioners, drove Oak Lodge and SWA to develop their own treatment plant. The CRW plant has greater excess capacity than the total capacity of NCCWC, so CRW is capable of providing treated water to all parties of the NCCWC.

The JOP goes on in Section C to provide a cooperative plan as follows:

- Optimizing the use of all three plants
- Optimizing the use of major pump stations
- Optimizing power consumption
- Facilitating expanded use of gravity flows and reservoir use
- Increasing coordination among the plants

The governance structure was also defined within the JOP, and the defined structure may have been a significant deterrent to plan implementation. The plan calls for designation of one individual to be the JOP Coordinator, to direct the transfer of water, to track and report on the cost of operating the system and allocate the costs to each party, and to develop a maintenance program for the system. There are four General Managers within the JOP participating entities; one each for SFWB, SWA, and CRW, and one shared by Oak Lodge and NCCWC. One concern of the participants could be self-serving. If the JOP were fully implemented to provide for the most effective and efficient use of the regional resources, including the water itself, the assets to produce and deliver water, there may be risk of elimination of certain positions. This is particularly likely at the upper management level. There is much duplication of administrative
efforts across the participants as all provide the same product in much the same way. Sharing of resources could include sharing of expertise and elimination of positions at some level.

The JOP Coordinator would also be responsible for developing an annual water supply and exchange plan based on the projected needs of the parties. The parties would have to agree to meet each year to update the JOP and revise if necessary. The idea of sharing that kind of power gave the participants some pause. Governance of the JOP needs to be collaborative, but with assurances of managerial autonomy for the individual entities.

The General Managers of the participating entities have recently been meeting and discussing implementation of the JOP. No specific steps have been taken to date. A committee approach similar to the JWC in Washington County may be the way to gain cooperation among the parties. Although the JWC has the City of Hillsboro as the managing partner, there may need to be a rotation system developed to limit perceptions of excess control from one party over the others. Developing a collaborative operational system ensuring benefit to all of the customers of the three parties would satisfy the interests of all.

Quieting the turmoil on the CRW Board should have a positive effect on the willingness of all parties to engage in the JOP for the benefit of all of the ratepayers. With the recent election of the three Board members that had been appointed by Clackamas County it seems that the voters have spoken and that they are satisfied with the new focus on water issues rather than political posturing.

**Meeting the interests of the individual entities**

Each entity has boundaries defined by their organizational structure. SFWB boundaries are defined by the city limits of Oregon City and West Linn. Both cities also have Urban Growth Boundaries (UGB) with the potential to annex properties into the city limits. Any properties
annexed could become water customers of the respective cities. On the Oregon City side those customers would be lost to CRW. From the perspective of SFWB there should be no difference as they provide water to both Oregon City and CRW. West Linn annexations would increase the number of customers and volume of water to be provided by the SFWB plant.

NCCWC boundaries are defined by the City of Gladstone city limits, the boundaries of SWA, and the District boundaries of Oak Lodge, which could change due to annexations. SWA boundaries are not subject to change due to annexations by the cities because SWA is a water authority. Gladstone is adjacent to Oak Lodge, so annexation by Gladstone wouldn’t impact production capacities at NCCWC, but could shift the demands from the water district to the City. Milwaukie annexations could have a minor impact on water demands within the JOP, but Milwaukie wells don’t have the capacity to provide for many more customers, so it is likely that intergovernmental agreements would be entered into to ensure water supply for all Milwaukie residents from either CRW or NCCWC.

CRW as a water district has the potential to shrink dramatically with annexations from the cities of Milwaukie, Gladstone, and Oregon City. The interest of CRW is to preserve the District’s boundaries and/or to increase water production for wholesale customers at the plant for greater operational efficiency.

NCCWC has an interest in maintaining sufficient capacity from their customers to keep the plant operating efficiently and effectively. They currently operate the plant 24/7 moving water from the treatment plant to the distribution systems of SWA, Oak Lodge and the City of Gladstone. They have revenue requirements based on fixed costs to keep the plant operating. If any one of their partners developed alternative water resources they would be challenged to meet
the revenue needs of the commission. They have an expectation that SWA will purchase at least the minimum commitment to keep the plant operating at peak efficiency.

SFWB has the interests of the Cities of Oregon City and West Linn as co-owners of the treatment plant. Any effort or activity that would impact the cities’ ability to annex property and deliver water from the plant to new customers is seen as a threat. SFWB is also committed to selling water at a price to cover the overall costs. The sales must be distributed among the entities to ensure that all expenditures can be met with revenues. If CRW developed an alternative source of water supply, SFWB would need to increase rates to Oregon City and West Linn to ensure revenue requirements would be met. This is related to primarily fixed costs involved in treatment and delivery of water.

![Figure 6](image)

**Figure 6**

**Force Field Analysis (Kurt Lewin) – Interests**

**Driving Forces (Positive forces for change)**
- DELAY OF CIP
- REDUCED COSTS
- STEWARDSHIP
- LOWER RATES

**Restraining Forces (Obstacles to change)**
- CRW Boundaries
- NCCWC Revenue
- SFWB Revenue

**RATIONAL USE OF RESOURCE**
A final concern for the JOP parties is the reliance on the Clackamas River with no alternative source for emergency needs. Coordination with the City of Portland for access to Bull Run water would benefit all parties if there were a problem with the Clackamas River source. The parties could also cooperate for the location and development of wells to provide for additional sources of water, or construction of additional pipeline to bring emergency water from the west side of the region. Reliance on a single source is not prudent.

Resiliency is a new watchword and an increasingly critical initiative for public utilities with aged infrastructure and concerns about earthquakes or landslides. The consequent impact on the system requires development of alternatives to rely on in an emergency. Building pipelines and interties predominantly for emergency use is an expensive proposition. This is an opportunity for the JOP partners to share the cost of new resiliency infrastructure.

Framing the analysis or the challenge of inter-jurisdictional cooperation requires examination of political structure as the primary frame for development of resources and a new leadership model. Using one frame could skew the interpretation and therefore the results. Adding to the political frame an analysis of the cultural and classic frame can provide for a broader understanding of the positions and interests of the entities involved.

Each entity has an elected board of commissioners. SFWB commissioners are selected from the city councilors of West Linn and the city commissioners from Oregon City and alternate chairing the Board on an annual basis. NCCWC’s board is also made up of representatives from their member organizations, SWA, Oak Lodge, and Gladstone. The residents within the district boundaries directly elect CRW board members. The elected officials all serve staggered four-year terms, so changes are frequent and common. The elected officials serving on the SFWB are a little different because they represent the citizens of the cities and
therefore have a broader connection with the citizens over a variety of issues; however their responsibilities on the SFWB are focused solely on water. The elected officials for NCCWC and CRW are only responsible for the treatment and delivery of water. From a political frame it is important to develop agreement and process that can maintain policy consistency even through changes in participants.

Consistency can be gained over time and election cycles by including the professional staff in the execution of the JOP. This brings in the cultural frame and the classic frame of the entities into the development of operational processes for implementation. Water as an industry has a distinct culture with a high degree of pride in the work that is performed, whether it is the treatment of water to meet or exceed state and federal requirements, the installation of a new service connection, or service to a customer resolving particularly challenging leak issues. Water providers also take on watershed management issues to be prepared for water quality events that occur upstream. The classic framework views water treatment (production) in light of its similarity to any type of manufacturing. Raw water comes into the treatment plant, chemicals are added, processes take place and a finished product (high quality drinking water) is delivered to the distribution system.

From these frames and from the JOP document and the IGA we can begin to develop a structure for implementation of the intent of the JOP and through the implementation can modify the JOP for improvement of the outcomes. The JOP begins with a stated objective of (Joint Operation Plan, 2001):

This Joint Operation Plan (JOP) is to implement the Water Supply Agreements between the South Fork Water Board (South Fork), the North Clackamas County Water Commission (NCCWC), and Clackamas River Water (CRW) for the purpose of operating and maintaining a transmission line between the three parties water treatment plants.
Further, this JOP will guide the sale or exchange of water between South Fork Water Board, the North Clackamas County Water Commission, and Clackamas River Water as further agreed to in an Intergovernmental Cooperative Agreement for Construction of Water Transmission Line, entered into on April 24, 2000, by South Fork Water Board, the North Clackamas County Water Commission and Clackamas River Water.

The stated objective limits the involvement and interaction to the construction and operation of Alignment B, but the JOP goes on to include specific goals of system optimization and cooperation among the entities. The parties have agreed to broader cooperation within the intergovernmental agreement for the pipeline construction, stating (Joint Operation Plan, 2000):

WHEREAS, the parties to this Agreement recognize that the most cost effective and efficient public water service will occur through cooperative planning and development of water supply and distribution; and

WHEREAS, the parties to this Agreement further recognize that providing interconnections between the individual water systems in the basin will be of regional benefit in providing affordable water to the citizens and in the event of emergency or shortage;

**Governance**

Governance in this complex environment requires strong collaboration and leadership among the parties. All three entities are members of the Clackamas River Water Providers (CRWP), a coalition of municipalities and districts that rely on the Clackamas River to deal with watershed management and conservation. This organization provides significant opportunities for the General Managers from the three primary participants as well as the sub-participants, such as SWA and Oak Lodge to meet, talk and gain trust with each other. SWA, which is the largest shareholder of NCCWC, has a General Manager that has been actively participating in JOP discussions as well as the ORS 190 entity discussion with CRW. The recent increase in communication among the JOP participants is providing opportunities to discuss interests and develop relationships of trust and open communication.
Management turnover at CRW since the agreement was signed has been viewed as a particularly challenging problem. While the other entities have had very stable management, CRW has seen significant turnover in General Managers. This can inhibit the desire of the other parties to engage in cooperative governance when they aren’t sure who they will be negotiating or agreeing with. The current General Manager has been with the District for five years, and has been engaging the other entities with frequent meetings and open discussions about regional cooperation.

Three of the four General Managers are near retirement. Based on the potential upcoming change in management, this may be the perfect time for these discussions to be reopened. If the current managers can agree upon a governance structure that will benefit all parties and implement that structure without worries about maintaining their fiefdoms, the customers of the entire region will benefit through lower costs and more efficient service.

Water system infrastructure is expensive and is generally out of sight as pipes in the ground. Much of the infrastructure in the Clackamas River basin is more than 50 years old, nearing the end of its useful life, and in need of repair or replacement. A lot of the existing infrastructure was funded, at least in part, by the Federal government but ratepayers will be required to fund replacement costs of these systems. Inter-jurisdictional cooperation is particularly viable and necessary in relation to providing water services, as operations are capital intensive and not readily transferable to other uses (Mullin, 2007). Cooperation can be more effective and efficient than changes in boundaries, but developing trust among various agencies or special districts is required to implement a shared services strategy.

Leadership framework for development and management of the JOP has been lacking since the completion of Alignment B. Staff for all entities understand the way this should work,
In January 2012, SFWB had to shut down the treatment plant due to debris in the river that damaged their water intake screens. All of the managers were on vacation, but the employees operated from a regional perspective to ensure water delivery to all customers by use of Alignment B to deliver water to SFWB customers, supplemented by water from the City of Lake Oswego through an intertie to the City of West Linn. CRW delivered water to NCCWC customers while the NCCWC water was diverted to the south. These actions were not written into any water supply agreements or intergovernmental agreements, but using the system as available water was delivered to all customers without issue. Based on this activity the General Managers could formalize this process for the benefit of all with a greater degree of certainty.

Operations of the JOP partners can be managed in a cooperative, rational way to ensure efficient movement of water and use of the regional resources as demonstrated by the line staff of all three entities. Formalization of the process would ensure consistent operational activities under various circumstances and could be followed into the future with new General Managers and new elected officials for certainty of process for any eventuality.
Chapter VII

Summary and Conclusion

A Joint Operation Plan was a good idea in 2001 and it is a better idea now. If the water districts had cooperated more fully in the 1990’s to rationalize production and distribution of water the NCCWC plant may have never been built. With three treatment plants on the lower Clackamas River within three river miles of each other and with the capacity of two plants capable of meeting current demands there are capital project expenses being paid for by current ratepayers for capacity they will not use in their lifetimes.

There has been a proliferation of local governments in the past fifty years most dramatically in special districts (Morgan, 2008). Creation of NCCWC as an ORS 190 in 1995 to coordinate efforts by Oak Lodge Water District and SWA to secure a consistent source of water demonstrates the ease of creating a special district, at least in Oregon. CRW and SWA are currently discussing creation of another ORS 190 entity to share services and define available water supply for the two entities. Smaller governments have challenges recruiting and retaining subject matter experts, so sharing certain technical services or personnel between two or more small governments is rational. More traditional entities including water districts may be stuck in an obsolete operational model where every town needs to own and staff it’s own complete water department. Now may be the time to look toward a new, more streamlined and efficient model of organization and governance.

Recently the City of Milwaukie has shared the finance expertise of the City of West Linn. The West Linn Chief Financial Officer and Deputy Chief Financial Officer had taken on the role of Finance Director for the City of Milwaukie. The cost to Milwaukie was less than the cost to hire a Finance Director, while bringing in additional revenue to the City of West Linn. This was
a two-year experiment and was quite successful; however changes in staffing at both West Linn and Milwaukie have caused them to return to the more traditional system of direct hire. Based on this success the City of West Linn shared a Library Director with the City of Wilsonville from January through April while pursuing the recruitment for a new Library Director. Cities have often shared a department director for short-term interim needs. Looking at sharing of expertise for a long-term or permanent need is a newer model that has not fully taken hold. With resources, particularly financial, in short supply the new model could easily become the new standard. In many jurisdictions the cost of personnel including wages, taxes and benefits is the largest appropriation of the budget. By finding and sharing expertise from similar organizations the entity can reduce the proportion of personnel services to the materials and services required to operate.

Water resources in the Clackamas River Basin are limited and must be shared. The Basin is approximately 941 square miles in area with significant geographic features (Salminen, 2005). The Basin provides water to many residents and businesses in Clackamas, Marion and Washington Counties through the City of Estacada, CRW, SWA, Oak Lodge Water District, the Cities of Oregon City, West Linn, Gladstone, Lake Oswego and Tigard. The Lake Oswego-Tigard Water Partnership agreement calls for increasing Lake Oswego’s withdrawals from the Clackamas River by 22 MGD to provide for up to 18 MGD to the City of Tigard with the remaining 4 MGD for future growth in Lake Oswego.

With limited water permits available, cooperative effort in the sourcing, treatment and delivery of water for the Clackamas River Basin is critical to environmental and economic resource management. Joint Operations would be more effective if all of the parties that use the basin were included in the discussion. Others in the region that currently rely on groundwater
from wells, such as the City of Milwaukie and Rockwood PUD may have an interest in participating in the cooperative implementation and execution of the JOP. As initial steps are taken among the original participants of the JOP a broader view of the region and the entire Clackamas River Basin would help to bring about greater stewardship of the economic and environmental resources of the region.
References


Joint Operation Plan

This Joint Operation Plan (JOP) is to implement the Water Supply Agreements between the South Fork Water Board (South Fork), the North Clackamas County Water Commission, (NCCWC), and Clackamas River Water (CRW) for the purpose of operating and maintaining a transmission line between the three parties water treatment plants.

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Background

A. The Water Supply Agreements among SFWB, the NCCWC, and CRW; provide the mechanism for the movement of water.

B. The transmission line, commonly known as “Alignment B”, will enable the beneficial use of the SFWB, NCCWC, and CRW water treatment plants and related water rights to meet both winter and summer water demands of all the parties.

Joint Operating Plan

A. Supply Area and Joint Transmission Line

Exhibit A presents a schematic of the key facilities and related service areas represented by this JOP. Operation of the connecting transmission line (Alignment B) between the SFWB and the NCCWC Water treatment Plant is the common facility that will be used to deliver and exchange water referenced in this JOP from the associated water treatment plants.

B. Supply Responsibility

The following summarizes the water supply agreements and related supply responsibilities:

1) South Fork Water Board shall supply water to:
   - Oregon City (all water needs)
   - West Linn (all water needs)
Appendix

- CRW – South pursuant to the CRW/SFWB Water Supply Agreement;
- The Commission pursuant to the agreement between SFWB and the NCCWC dated February 29, 2000.

2) The Commission shall:
- Supply water to all NCCWC members
- Distribute 2.5 MGD to be delivered to NCCWC from CRW pursuant to the agreement between CRW and dated-March 1, 2001.
- Provide water to SFWB as requested in accordance with this agreement

3) CRW shall supply water to:
- CRW – North (All water needed.)
- NCCWC pursuant to the Water Supply Agreement between CRW and NCCWC.
- CRW – South in excess of the amount to be delivered by SFWB per the SFWB/CRW Water Supply Agreement
- SFWB, pursuant to the Water Supply Agreement between SFWB/CRW.
- The City of Gladstone, the City of Milwaukie and Rockwood PUD pursuant to water supply agreements between CRW and these providers.

C. Operating Plan to Meet Supply Requirements of Parties
The Operating Plan is intended to attain certain objectives including:
- Optimizing the use of all three plants
- Optimizing the use of major pump stations
- Optimizing power consumption
- Facilitating expanded use of gravity flows and reservoir use
- Increasing coordination among the plants.
Appendix

Accordingly, the pipeline, pump stations, reservoirs, and treatment plant shall be operated to facilitate movement of water among the providers as follows:

1) SFWB, NCCWC, and CRW managers will designate one individual (and a back-up) to be responsible for coordinating the water supply transfers among the three parties in accordance with this JOP. In the absence of clear written direction from the parties, the JOP Coordinator will direct the transfer of water using his/her best judgment to meet the objectives of this JOP.

2) The transfer of water will be metered on a daily basis.

3) The JOP Coordinator will document monthly the cost of maintaining and operating the System and allocate the cost to each party.

4) The JOP Coordinator will provide a summary of the monthly water exchanges among the parties. The net transfer of water will be documented and presented to all parties.

5) If additional cost is incurred beyond the budgeted and/or projected cost, the JOP Coordinator will define the cost and assign it to the benefiting party. The information will be forwarded to the managers for their use.

6) The JOP Coordinator will provide a maintenance program for the System.

D. Annual Supply Plan

1) The JOP Coordinator will develop an annual (January 1 to December 31) water supply and exchange plan based on the projected water plan of the three parties, no later than November 30 of each year, for the subsequent year. If no new plan is submitted, the previous plan will be followed.

2) If an exception to the Annual Supply Plan is requested by one of the parties, the JOP Coordinator shall seek to meet the needs of the party consistent with the intent of the supply agreements.

E. Emergency Response and Service Reduction

1) In case of an emergency the parties agree to supply water as required and available.
Appendix

2) If a general emergency or water shortage requires restrictions on the delivery of water, all retail service areas will be considered in common with reduction on a pro rata basis.

F. Revisions to JOP

The managers of the three water supply agencies will meet annually to update the JOP and water use projections. The JOP may be revised by unanimous agreement of the managers.

SOUTHERN FORK WATER BOARD

By: [Signature]

Dan Bradley, General Manager

CLACKAMAS RIVER WATER

By: [Signature]

Dale Jutila, General Manager

NORTH CLACKAMAS COUNTY WATER COMMISSION

By: [Signature]

Fred Whitfield, Chairman

ORIGINAL

July 2001
INTEGOVERNMENTAL COOPERATIVE AGREEMENT
FOR CONSTRUCTION OF WATER TRANSMISSION LINE

THIS AGREEMENT is made and entered into by and between the SOUTH FORK WATER BOARD (herein referred to as "South Fork"), an Oregon intergovernmental entity organized under ORS Chapter 190, CLACKAMAS RIVER WATER (herein referred to as "CRW"), an Oregon Domestic Water Supply organized under ORS Chapter 264, and the NORTH CLACKAMAS COUNTY WATER COMMISSION (herein referred to as "the Commission"), an Oregon intergovernmental entity organized under ORS Chapter 190, which shall be jointly referred to herein as "the parties."

Recitals:

WHEREAS, the parties to this Agreement are suppliers of domestic water for the citizens of the Clackamas basin and adjacent areas; and

WHEREAS, the parties to this Agreement recognize that the most cost effective and efficient public water service will occur through cooperative planning and development of water supply and distribution; and

WHEREAS, the parties to this Agreement further recognize that providing interconnections between the individual water systems in the basin will be of regional benefit in providing affordable water to the citizens and in the event of emergency or shortage;

NOW, THEREFORE, the parties agree as follows:

1. Construction of Transmission Line. The parties agree to participate in the cost of engineering and construction of an interconnecting transmission line between the South Fork plant and the Commission's plant. Specifications of the interconnecting transmission line are to be agreed upon based upon the results of an engineering analysis.

2. Cost Allocation. The costs of engineering, and construction shall be divided equally among the parties. Preliminary cost estimates for engineering, construction and administration are shown in Attachment "A," which is incorporated herein by reference. It is agreed that each party shall have the right to review bids which are received for the costs associated with this project, and that no bid shall be accepted without the approval of all parties; however, no party shall have the right to reject the low bid if it is within 15 percent of the engineer's estimate as presented in Attachment "A." If one of the parties does not approve the low bid, the other two may accept the bid with the provision that all costs of the project and ownership will be shared only between the approving parties. Notwithstanding the rejection of the low bid by one of the parties, the rejecting party shall continue to be bound by the remaining terms of this agreement.
3. **Water Wheeling.** The parties agree that the intent of this agreement is to enhance the ability to move water among the parties and to optimize the use and production of water from the three parties’ treatment plants. The parties agree to supply water as follows:

a) South Fork shall supply water to:

- Oregon City;
- West Linn;
- CRW – South at an annual average of 2mgd (unless otherwise agreed by South Fork and CRW);
- the Commission pursuant to the agreement between South Fork and the Commission dated February 29, 2000.

b) The Commission shall:

- supply water to Oak Lodge;
- wheel its water through CRW’s system to Mt. Scott and Damascus, together with 1.5 mgd to be delivered to the Commission from CRW pursuant to the agreement between CRW and Mt. Scott dated May 1, 1995;
- provide water to the South Fork Water Board as requested in accordance with this agreement;

c) CRW shall supply water to:

- CRW – North;
- 1.5 mgd to the Commission as described above;
- CRW – South over the 2 mgd annual average to be delivered by South Fork;
- The City of Gladstone in accordance with the agreement dated April 9, 1985;
- The City of Milwaukie in accordance with the agreement dated July 1, 1998;
- The South Fork Water Board as requested in accordance with this agreement.

In addition, each party agrees, upon request from any other party to this agreement, to enter into one or more water wheeling agreements with the requesting party, upon such terms and conditions as are reasonable in the industry. However, no party shall be required to wheel water if it would not be technically feasible, or if wheeling would create a hardship for the party being requested to do so.

4. **Ownership of Transmission Line.** The transmission line to be built under this Agreement shall be jointly owned by the parties, subject to the limitations set out under Section 2 of this Agreement.

5. **Project Management.** The parties agree that construction management of the interconnecting transmission line project shall be by the General Managers of the parties or their designees, whose mutual consent shall be required for any decisions. If they are unable to agree, the matter shall be resolved under the dispute resolution provisions of this agreement.
The Commission agrees to provide a lead field person to inspect construction of the interconnecting transmission line. The costs related to these staff persons will be included in the cost of the project.

6. **Commission to Serve as Contract Administrator.** For purposes of the work authorized by this agreement, the Commission shall function as the contract administrator and shall serve as the primary contracting public agency. The Commission and the parties shall jointly prepare and review design and construction documents prior to bid. The parties shall be invited to project meetings and shall be given progress reports by the Commission with opportunity for comment. Change orders must be approved by all parties. The Commission shall receive invoices for the various project-related costs from the various responsible contractors and shall invoice South Fork for its one-third share and CRW for its one-third share, and enclose copies of the contractors’ invoices. The Commission shall transmit the Engineer’s Certification for Payment and other progress payment information if requested. Payment shall be due within thirty days of invoice. The Commission shall provide a final project accounting to ensure that the financial allocations set forth in this agreement are met with respect to final project construction costs. All performance and payment bonds and guarantees shall be for the benefit of all parties.

7. The transmission line between the South Fork Water Board and North Clackamas County Water Commission plants will be 24-inches in diameter, unless compelling evidence is provided to increase the size.

8. Engineering services will be provided by Economic and Engineering Services, Inc.

9. **Dispute Resolution.** If a dispute arises between the parties regarding this Agreement, the parties shall attempt to resolve the dispute through the following steps:

   **Step One (Negotiation):**

   The Manager or other persons designated by each of the disputing parties will negotiate on behalf of the entity they represent. The nature of the dispute shall be reduced to writing and shall be presented to each Manager, who shall then meet and attempt to resolve the issue. If the dispute is resolved at this step, there shall be a written determination of such resolution, signed by each Manager and ratified by their respective Board or Council, which shall then be binding upon the parties.

   **Step Two (Mediation):**

   If the dispute cannot be resolved within thirty (30) days at Step One, the parties shall submit the matter to non-binding mediation. The parties shall attempt to agree on a mediator. If they cannot agree, the parties shall request a list of five (5) mediators from the Presiding Judge of Clackamas County Circuit Court. The parties will attempt to mutually agree on a mediator from the list provided, but if they cannot agree, the mediator will be selected by the Presiding
signed by each Manager and ratified by their respective Board or Council.

Step Three (Arbitration):

If the parties are unsuccessful at Steps One and Two, the dispute shall be resolved by binding arbitration proceedings pursuant to ORS Chapter 36. The parties shall follow the same process as in Step Two for the selection of the arbitrator. Upon breach of this agreement, the non-defaulting parties shall be entitled to all legal or equitable remedies available, including injunctive relief, declaratory judgment, specific performance and termination. The prevailing party(ies) in Step Three shall be entitled to reasonable attorney fees and costs which have been incurred during the Step Three process, as may be awarded by the arbitrator.

10. Authority. The signatories to this Agreement each represent that they have authority to enter into this Agreement pursuant to their respective organizational documents.

11. Amendment. This Agreement may be amended only by a written instrument executed by all parties.

12. Indemnity. Subject to ORS 30.260 - 30.300 and the debt limitations provided by law, each party shall indemnify and defend the others, its Board, officers, agents and employees from any claim, loss, or liability arising out of or related to any activity of that party or any condition caused by the act or omission of that party, to the extent the same is not caused or contributed to by another party or parties to this Agreement.

13. Nonassignment. Except as otherwise provided by law, this Agreement shall not be assigned without the written consent of all signatories to this Agreement.

14. Counterparts. This Agreement may be executed in counterparts and each counterpart shall be considered an original document.

15. Waiver. Failure of any party at any time to require performance of any provision of this Agreement shall not limit the party's right to enforce the provision except to the extent expressly set forth in a writing signed by such party, nor shall any waiver of any breach of any provision constitute a waiver of any succeeding breach of that provision or a waiver of that provision itself.

16. Effective Date. The effective date of this agreement shall be [April 12], 2000.

17. Notices. Notices shall be deemed sufficient if deposited in the United States mail, postage prepaid, to the following addresses:
South Fork Water Board
Attn: General Manager
15962 S. Hunter Avenue
Oregon City, Oregon 97045

Clackamas River Water
Attn: General Manager
P.O. Box 2439
Clackamas, OR 97015

North Clackamas Water Commission
Attn: General Manager
10602 S.E. 129th Avenue
Portland, Oregon 97236

IT IS SO AGREED:

The South Fork Water Board:

By: [Signature]

John Williams, its Chair

The North Clackamas County Water Commission:

By: [Signature]

Mark Knudson, its President

Clackamas River Water:

By: [Signature]

Paul Rogers, its Chair
Attachment “A”

<table>
<thead>
<tr>
<th>Estimated Construction Cost for 24-inch Transmission Main</th>
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<td>Construction</td>
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<tr>
<td>Engineering</td>
</tr>
<tr>
<td>Administration</td>
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<td><strong>Total</strong></td>
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Appendix

Figure 1: Chart of water permits issued in the Clackamas River Basin.

Figure 2: Individual Capacity and Demands of the JOP participants

<table>
<thead>
<tr>
<th></th>
<th>Capacity</th>
<th>Average Day Demand</th>
<th>Peak Demand</th>
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<tr>
<td>CRW</td>
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<td>NCCWC</td>
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<td>6.3</td>
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<td>SFWB</td>
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<tr>
<td><strong>Total</strong></td>
<td><strong>62</strong></td>
<td><strong>23.3</strong></td>
<td><strong>47.6</strong></td>
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Figure 3: Combined Capacity and Demands of the JOP Participants

<table>
<thead>
<tr>
<th></th>
<th>Capacity</th>
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<td><strong>Total</strong></td>
<td><strong>62</strong></td>
<td><strong>23.3</strong></td>
<td><strong>47.6</strong></td>
</tr>
</tbody>
</table>

Figure 4: Representation of the three water treatment plants and the entities that are supplied water by the treatment plants. Clackamas River Water (CRW) provides water to retail customers in the CRW North Service Area and to Sunrise Water Authority (SWA) as a wholesale customer. North Clackamas County Water Commission provides water to the three owners based on projected demands and the following ownership; SWA at 48%, Oak Lodge Water District at 42%, and the City of Gladstone at 10%. South Fork Water Board provides water to the two owners of the treatment plant; the City of Oregon City and the City of West Linn, and sells water on a wholesale basis to CRW for the South Service Area (formerly Clairmont Water).

Figure 5: This graphs the components of residential retail water charges from the water providers sourced from the three treatment plants. All of the entities have varied rate schedules with more or less emphasis on the base charge (monthly fixed) compared with the consumption charges.

<table>
<thead>
<tr>
<th></th>
<th>CRW</th>
<th>NCCWC</th>
<th>SFWB</th>
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<tr>
<td><strong>Base Rate</strong></td>
<td><strong>$27.60</strong></td>
<td><strong>$16.69</strong></td>
<td><strong>$23.70</strong></td>
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<td><strong>CRW</strong></td>
<td>9.54</td>
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<td><strong>Gladstone</strong></td>
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<tr>
<td><strong>Oregon City</strong></td>
<td></td>
<td></td>
<td></td>
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<tr>
<td><strong>Consumption</strong></td>
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</tr>
<tr>
<td><strong>Total</strong></td>
<td>27.60</td>
<td>16.69</td>
<td>23.70</td>
</tr>
</tbody>
</table>

Figure 6: Graphic displaying the forces at work that may lead to implementation of the JOP and the forces that are restraining or obstacles to implementation. Cost savings among all of the water providers generates significant motivation for implementation. Obstacles to change include the desire to remain autonomous and the concerns of CRW related to district boundaries and of SFWB and NCCWC treatment plants to ensure stable revenue streams for operations.