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Thurston County Water Realities
In Relation to Planned Development
2008



Funded by the League of Women Voters of Washington
Education Fund

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FOREWORD

You never miss the Water till the well runs dry.
—Rowland Howard, 1856

In May of 2007, League of Women Voters Thurston County undertook a one-year study of water resources in Thurston County. This report is the result of that inquiry.

There is a great deal more to be said. Another month, another year or two, would surely add helpful information. Our hope is that a discussion will begin and further study will ensue.

It was tempting to call this the first report or Part One, but what if there were never a follow-up? That would be unfortunate. This is truly the first step. More information is out there that needs to be drawn together to create an effective data bank, and more such material needs to be integrated as research

projects are completed. A series of follow-up studies would be a positive result from this report.

Meanwhile, the present study will at least provide League of Women Voters Thurston County good background information with which to educate the public and influence public policy. The resources listed at the end of this report should provide a valuable guide for those seeking further information.

Research by committee members is available on the League of Women Voters Thurston County website: www.lwvwa.org/thurston.

Here in Thurston County—as in Washington State, the United States and the world—we need to act quickly to preserve this precious, irreplaceable resource: water.

—E. L. Johnson, April 14, 2008

INTRODUCTION

Imagine going to your kitchen sink one hot summer day and turning the tap. Will water flow? Will it be enough? Will it be clean enough for your family to drink? Will it be sufficient to keep your garden alive?

When people think about water, if at all, they assume an appropriate government entity is looking out for the supply. Housing developments are going in all around our area, so people know that local governments are authorizing growth. People might also assume that the growth planning process includes water availability.

During the last five years in Thurston County alone, 2,297 wells were drilled, most of which are private; the quantity of water being withdrawn from these wells is not known. Is the level of the groundwater, into which those wells are tapping, dropping? Does any government entity check on that? Will our area have adequate warning of a water supply problem?

League of Women Voters Thurston County

(LWVTC) has long had an interest in orderly growth management and comprehensive planning. The League has initiated this study because water availability does not appear to be a priority in the local planning process.

Quantity and quality of our water supply are equally important. Adequate supply is meaningless if the water is not clean and useable. Since there are more legislative directives and agency activities related to water quality than water quantity, the initial focus of this report is on issues of quantity.

In some areas of Thurston County water supply limits have been reached.

Lacey, northeastern Thurston County, and Yelm are seeking increased supply. They are engaged in strategies to make their existing resources go further. These areas are in water basins that are closed to new rights. In spite of these challenges, state and local governments continue to project additional growth.

WATER AS A PUBLIC RESOURCE

Under the public trust doctrine, which is derived from Roman law, air, rivers, the sea and the seashore are acknowledged to be shared property with shared access. As the doctrine evolved under English common law, the King was made the trustee of the commons, responsible for protecting rivers for commerce, transportation and fishing as well as for protecting other common resources, such as land.

The doctrine transferred to the American colonies. Our current federal and state public land system, composed of forests, parks, refuges and natural areas evolved from this ideal.

There is an inherent conflict between an individual interest in overusing a shared resource for personal gain, versus the impact on the greater community when this overuse degrades or depletes the resource upon which the public depends.

Water is a public resource, and should be protected by the public trust doctrine.

Water resource regulation

In 1917, the Washington Legislature enacted the initial Water Code, affirming that all waters within the state belong to the public, subject to existing rights. The Water Code provided centralized water administration by the state. While the Water Code did not affect then existing rights (pre-1917), it did establish a state permitting system as the exclusive way to acquire new rights. A water right claim is simply that—a claim to a water right for putting water to a beneficial use prior to the state establishing its water permitting system. The validity of a claim can only be confirmed through judicial processes.

Most water rights in Thurston County (and Washington state) are based on prior appropriation, the doctrine in the state Water Code meaning that the person who first claimed and used the water has

ongoing and perpetual legal priority. This continues as long as the water is put to beneficial use. Any water rights not used during a five-year period are theoretically relinquished to the state.

In Washington State, the Department of Ecology (ECY) administers water resources, including water rights and resource planning. The water right provisions for both surface and groundwater are based on the principal of “first in time, first in right.” State law prohibits a junior right holder’s water consumption from diminishing the available water for a senior right holder. These requirements are not consistently monitored or enforced.

In granting water rights, ECY is required by law to consider four criteria: availability of water, beneficial use of water, impairment of other rights, and public interest. ECY is guided by statutes and court decisions.

Along with the state role, the federal government has a major role in water quantity policy. The federal government holds major reserved water rights for navigation, national forests, military bases, the Endangered Species Act, and for Indian reservations and off-reservation Indian treaty rights. Tribal rights are significant for Washington State because there are many tribes for which water rights are reserved, both directly and indirectly, particularly for fishing. Reserved tribal water rights are protected by the federal government; because they predate statehood, they are senior rights.

In addition, the Federal Energy Regulatory Commission licenses dams, the Corps of Engineers implements water projects, and the Bureau of Reclamation operates many irrigation projects.

The Washington Legislature passed Municipal Water Law (HB 1338) in 2003 to provide additional certainty for municipal rights. The law declared that water rights issued to municipalities before September 2003 to be in good standing, but new water rights issued to municipalities would be based on beneficial

use. Numerous environmental organizations and tribes have challenged the constitutionality of this law, objecting to:

- Inclusion of private water entities in the definition of “municipal water supplier”;
- Elimination of the beneficial use requirement for municipal water suppliers, replacing it with existing capacity;
- Changes in the place of use determination, which litigants say deprives property owners of vested rights without due process;
- Usurping tribal water rights that are senior to the municipalities.

Water Quality Regulation

The Environmental Protection Agency (EPA) and states have concentrated more effort and funds on developing tools to assess the quality rather than quantity of water

Management of water quality requires an understanding and consideration of the relationship between quality and quantity and the cost effectiveness of pollution prevention. The uses of water are limited or precluded by the quality of the water. Two major federal laws that have supremacy over state water quality laws are the Clean Water Act (CWA) and the Safe Drinking Water Act (SDWA).

EPA delegates significant authority to the state to administer these two laws. ECY implements federal and state water pollution control laws, while the Department of Health (DOH) implements the federal and state safe drinking water laws. DOH also relies

on local health departments to assist with the drinking water requirements.

If water is contaminated, the cleanup is costly, lengthy and sometimes impossible.

The most prevalent potential sources of water contamination in Thurston County are:

- Commercial/industrial spills;
- Agriculture run-off;
- Storm water run-off;
- Wastewater discharge;
- Residential septic systems;
- Undetected leaks from underground petroleum storage tanks.

Laws governing the right to discharge effluent into water are not aligned with the legal system for granting rights to use water, (although diluting effluent in water is arguably a use).

Thurston County’s primary source of drinking water is groundwater. There are three distinct sets of state water quality standards: surface water, groundwater and drinking water. Thurston County and ECY monitor each separately and track water quality under different criteria.

Fifty contaminated sites were identified within Thurston County by ECY. Severity of the contamination and accomplished site cleanup vary. Shallow aquifers may be at risk from such sites.

McAllister Springs, Olympia’s principal source of water is vulnerable from an accident on I-5 or the heavily traveled rail line, which runs through the Nisqually Valley.

WATER IN THURSTON COUNTY

In the fall of 2007, there were 560 water rights applications pending within Thurston County, of which the Department of Ecology (ECY) had processed about a dozen by year's end. All told, ECY has issued about 2,600 water rights in the County. Most of the applications are from municipal governments intending to serve their urban growth areas (UGAs).

Two principal watersheds serve northern Thurston County: the Nisqually and the Deschutes. The Nisqually watershed contains multiple layered aquifers, collectively producing about 800 cubic feet of water per second. Most of this water flows to Puget Sound without prior use. Nisqually watershed aquifers supply most of the water for Olympia and Lacey and all of Yelm's water.

Summer stream flows in the Nisqually and Deschutes have declined over the past thirty years, gradually pushing native salmon species toward extinction. Some of the most severe droughts in the Nisqually watershed are due to building snowpack and lack of run-off in November and December. Low surface water flows also negatively affect the aquifer.

Exempt wells

Exempt wells are those that draw water of 5,000 gallons per day (gpd) or less and are thus exempt from the necessity of acquiring a water right. They are not, however, exempt from water law. For example, an exempt well may not harm another water right holder.

When the law authorizing exempt wells was enacted, Washington's population was much smaller and such individual wells were assumed to have a minor impact, causing no harm to other water right holders. This has now changed. There has been an increase in water drawn from exempt wells, mostly in the County, an increase that may be due in part to the halt in issuing water rights in many areas. This additional water use has arguably resulted in raiding some senior water rights holders' allocation.

Olympia

McAllister Springs (a part of the Nisqually Watershed) regulated as surface water, provides 70 percent of Olympia's water and is its only year-round source. The goal of Olympia's water management practice, set by the City Council, is sustainable water use. Olympia has been aggressively promoting conservation since the mid 1990s. While the number of Olympia water connections has increased by 10 percent, water use has decreased by 10 percent. Olympia has moved toward a rate structure in which the cost per unit of water rises as the amount of water consumed increases.

The City's water system plan is under its six-year revision as required under state law. Potential water supply options are, additional conservation, reclaimed water, wholesale purchase commitments, new wells, the McAllister well field, and the former Olympia Brewery property. For example, the State Capital's Heritage Park in downtown Olympia is now irrigated with reclaimed water from LOTT, the area wastewater treatment facility. These efforts have the potential to offset some aquifer withdrawals. However, using reclaimed water is not without costs since additional plumbing is required. Olympia has funded half of the park project from development and half from existing ratepayers.

Lacey

Lacey's water system is mostly supplied by 19 wells located throughout the area. The city's older wells primarily withdraw from the shallower aquifer; newer wells withdraw from the deeper aquifers. Because withdrawals from the deepest aquifer have less impact on surface waters, Lacey intends to provide most of its future water supply from this aquifer. Lacey purchases some water from Olympia.

Some of Lacey's water rights applications, now pending before the Department of Ecology, go as far back as 1994. As is the case with most Thurston

County cities and towns requesting water rights, developers are expected to provide mitigation measures. Applicants must perform hydro-geological modeling to quantify the impacts to be mitigated. As such, Lacey, Yelm, and Olympia have coordinated modeling efforts. They are working regionally on mitigation strategies for predicted impacts of newly issued water rights on streams, rivers, and lakes. This approach may include recharging aquifers with reclaimed water, purchasing riparian properties and relinquished water rights.

Lacey's ability to provide water to meet growing demands reached a critical point in June 2005. The Lacey City Council imposed a moratorium on new water system connections in its unincorporated urban growth area. The city can therefore focus its limited excess capacity for development within the city limits. Developers, seeking to build projects with city water, have tried to annex to Lacey without success. Litigation is underway in response to one developer's attempt to force the City of Olympia to provide water through an agreement with Lacey.

Lacey now appears to have developed to the limit of its water supply. Nevertheless, the annual update of population forecasts by Thurston Regional Planning Council (TRPC) continues to forecast rapid growth in Lacey. One prospect for the city is the potential to acquire a share of the former Olympia Brewery water rights, together with Olympia and Tumwater.

Tumwater

It is predicted that Tumwater will have a moderate water shortfall. The city has identified a potential new well site and completed some of the necessary studies to prove that additional wells would not have an adverse impact on the Deschutes River. Tumwater has also acquired two small wells, for which it has applied to ECY for change of place and type of use permits. If these efforts are successful, the city will be able to accommodate its projected growth up to 2030.

In 1993, Tumwater's main source of drinking water, part of the Palermo Wellfield in the Deschutes Valley, had to be taken off line due to serious contamination. The field holds six production wells providing

approximately fifty percent of the city's water demand. Soil and groundwater in the area are contaminated with tetrachloroethene and trichlorethane. The cost of the initial clean up was in excess of \$6 million with annual maintenance costs in the hundreds of thousands of dollars. Groundwater treatment continues, with reviews of the plans scheduled in five-year increments.

Yelm

Yelm has a severe shortfall of water capacity compared to its anticipated population. There may be some homes that are not metered and some exempt wells within city limits.

It is the city's intention to connect water users within city limits to its municipal system. Water quality is tested daily for pH and chlorine and for *E. coli* once a month at six different locations.

Yelm began using a reclaimed water system earlier this decade with grant assistance from the state. Its plan acknowledges that the watershed basin is closed to the issuance of additional water rights. Yelm needs to acquire new water rights, more than triple its current inventory, to accommodate growth assigned to it by TRPC.

Yelm has purchased a small number of water rights from landowners in the area. Purchased rights require a change of use approval from ECY.

Thurston County

Thurston County does not generally provide water service to the rural area. This is a matter of county policy and, since providing water is considered an urban public service, it is consistent with the Growth Management Act. Developments within designated urban growth areas are expected to receive water service from an adjacent municipal water utility. The county may become the water system operator in a health emergency or if a private water system fails.

Grand Mound Urban Growth Area in the southern part of the county is unique, as there is no adjacent incorporated municipality. As a stand-alone unincor-

porated urban growth area, Thurston County is, by default, the urban service provider for water and sewer systems.

In addition, the county operates two small rural water systems: Tamoshan, on Cooper Point, and Boston Harbor. Both areas experienced high-density development before the adoption of the GMA. Other than these three examples, water used by residences and businesses in the rural unincorporated area of the county comes from exempt wells and small, private water systems.

Thurston County allows no more than three hook-ups per well.

Thurston County Public Utility District

Distinct from Thurston County government, but within its boundaries, is the Thurston County Public Utility District (PUD), managed by three elected commissioners. The Thurston County PUD has 150 water systems under its jurisdiction, 50 of which are in Thurston County with more than 1,900 customers. Other systems are in Pierce, Lewis, Mason, and Grays Harbor Counties. All these systems rely on groundwater. The PUD is funded by property taxes and fees for water services.

The largest PUD system serves Tanglewilde and Thompson Place in Lacey's UGA. The PUD purchases water from Olympia for this area. When PUD acquires water companies, water rights are included. PUD has long-range plans for substantial growth and upgrades.

Reservation of groundwater rights for north county area

In 1986, ECY adopted chapter 173-591 of Washington Administrative Code (WAC) to designate a groundwater reservation for northern Thurston County. The reservation area includes the Olympia airport, Allison Springs, the Deschutes Valley, Hawks Prairie, McAllister Springs, and the Mottman Industrial Park. The priority date of 1986 was established with ECY. As part of the reservation agreement, the county must follow the provisions of the WAC, which imposes water assessment and coordination requirements.

Private water delivery

UTC regulates privately owned water supply systems of 100 connections or more, and smaller systems if the annual customer charge exceeds \$300, subject to inflationary adjustments. They regulate rates, services, and facilities. There are many of these in Thurston County.

Private water companies with 2 or more connections must meet state drinking water standards. Systems with 15 or more connections, or serving 25 or more individuals, must also meet federal Safe Drinking Water Act standards.

They are subject to chapter 19.86 RCW (Consumer Protection Act) and DOH monitoring for water quality.

WATER PLANNING IN THURSTON COUNTY

Growth Management Act

Thurston County is subject to the planning requirements of the Washington State Growth Management Act (GMA), which contains among its 13 planning goals [chapter 36.70A.020(10) RCW]:

“Environment. Protect the environment and enhance the state’s high quality of life, including air and water quality, and the availability of water”

GMA requires the state Office of Financial Management (OFM) to develop a 20-year population forecast (expressed as a range) on a per-county basis. Any population forecast used by local governments for GMA planning must be within OFM’s high and low range.

Thurston Regional Planning Council (TRPC) is a consortium of local governments, including the county, cities, Intercity Transit, LOTT, PUD No.1, several school districts and two county tribes. TRPC’s mission is to Provide Visionary Leadership on Regional Plans, Policies and Issues. TRPC provides both county wide/Urban Growth Area forecasts to help local jurisdictions in planning.

Although TRPC’s methodology is somewhat different from OFM’s, TRPC’s forecasts have always fallen within the OFM range. TRPC projects that by the year 2030 Thurston County’s population will grow to 375,000, reflecting a 35-year growth from 75,000 in 1970, to 225,000 in 2005. This projection takes into account the recession at the beginning of the 2000 decade and an expected increase in out-bound commuters working in Pierce County who buy homes in Thurston County. The projected increase in population will influence both transportation and land use planning and will undoubtedly stimulate demand for more water use.

Comprehensive plans and development regulations guided by the GMA should ensure that utilities can provide potable water to the communities within the

county as the population grows. Water planning is carried out by each municipal water utility and DOH has authority to approve utility plans.

Additionally, RCW 58.17.110(2) states: “A proposed subdivision and dedication shall not be approved unless the city, town, or county legislative body makes written findings that; . . . Appropriate provisions are made for the public health, safety, and general welfare and for such open spaces, drainage ways, streets or roads, alleys, other public ways, transit stops, potable water supplies, sanitary wastes, parks and recreation, playgrounds, schools and school-grounds and all other relevant facts. . .”

Local implementation

City and county planners are required by law to evaluate the availability of water for each proposed subdivision—a plat by plat approach that ignores the nature of regional water availability issues, particularly those resulting from the hydrologic continuity of surface and ground water, which cross political boundaries. This statutory requirement led the City of Lacey to conclude that they could not guarantee water to subdivisions in both the City and the unincorporated UGA. Thus in 2005, Lacey stopped authorizing water service to new subdivisions in the UGA. Consequently, Thurston County stopped approving new subdivisions in the unincorporated Lacey UGA.

Washington State’s water policies and regulations allowing rural exempt wells creates a cost disadvantage for urban water systems which need to obtain new water sources and undermines GMA policy.

While cities and towns struggle to conserve, reuse and purchase existing water rights, rural property owners can obtain water by simply drilling an exempt well. In some cases, rural developers connect multiple houses on one exempt well--popularly called a six-pack. Some developers install many adjacent six-packs to serve a large subdivision. The State Supreme Court has ruled that this use of exempt wells violates state law.

TRPC's Buildable Lands Report for Thurston County, required by law of six Western Washington counties under a 1997 amendment to the GMA, is intended to show that the county can accommodate the predicted 20 years of population and job growth. The report concludes that recent rural rezones will shift population to the urban areas. Therefore, less land will be consumed for the same number of homes in the urban boundaries, and less infrastructure will be needed to support compact development. Water availability is not factored into the analysis at this time. TRPC assumes the availability of water. The Buildable Lands Report requirement of the GMA could be expanded to include water availability. The result would be better coordination between development and water supply.

Watershed Planning

In 1998, the Watershed Planning Act and the Salmon Recovery Act were legislated. The former was designed to find a means to overcome the long history of conflict over water supply and water rights in Washington. The latter responded to the impending listing of several salmon stocks under the federal Endangered Species Act (ESA).

Planning under the Watershed Planning Act is organized by 62 geographic areas called Water Resource Inventory Areas (WRIAs). Thurston County contains portions of four separate watersheds: Nisqually River, Chehalis River, Deschutes River, and Kennedy-Goldsborough Creek. The act allows watershed-planning groups within WRIAs to determine whether to address water quantity issues alone, or whether to expand to include water quality, habitat, storage, or minimum instream flows. Participation in the Watershed Planning Act is voluntary, with grants available from the state.

Under the Act, the watershed planning process has four phases: Phase I, organization; Phase II, data collection and assessment; Phase III, watershed development plan; and Phase IV, implementation. At the end of a three-year planning period, a two-year extension is obtainable.

The last two watershed plans granted approval were in Thurston County.

1. Nisqually River Watershed – adopted

Phase IV, the implementation plan, was approved in February 2007. This was a six-year effort with the Nisqually Tribe as the Lead Entity in both watershed and salmon recovery planning, (the only tribe in the state to provide leadership in both roles).

Recommendations include:

- Identify aquifers for potential supply;
- Assess, negotiate and possibly undertake rule making;
- Monitor the quantity and quality of stream flows and groundwater supplies;
- Understand the interconnection between groundwater and surface water, including the impact of exempt wells on groundwater;
- Strengthen the Coordinated Water System Plan (CWSP) policies to provide a more direct link between land use planning and water supply availability.

2. Chehalis Basin Watershed – adopted

Grays Harbor County was the lead entity. This process involved three counties: Grays Harbor, Lewis, and Thurston. In June of 2007, the three boards of county commissioners adopted an implementation plan, which included 55 major recommendations. Their number one priority is monitoring groundwater.

3. Deschutes Basin Watershed – not adopted

A substantial effort went into planning for this watershed but, in the end, the Squaxin Island Tribe did not support the draft plan. Their veto terminated the planning process.

4. Kennedy-Goldsborough Creek Watershed – not adopted

Similarly, the Squaxin Island Tribe did not support the draft plan for this watershed and their veto terminated the planning process.

Failure to complete the planning process in the Deschutes and Kennedy-Goldsborough WRIAs means there is no coordinated effort to address water

quantity and quality issues in these watersheds. Furthermore, these WRIAs will be unable to receive additional funding to implement water management plans. The data generated is useful for other purposes. Each watershed plan identified the number of water rights and quantity of water allocated, all of which is available on the Internet.

Coordinated Water System Plans

Pursuant to chapter 70.116 RCW, a Coordinated Water System Plan (CWSP) covers one or more public water supply systems developing plans for critical service areas. The first CWSP for north Thurston County was adopted in 1982, covering the water needs of Lacey, Olympia, and Tumwater. It projected a shortfall by 2030. A supplement was adopted in 1986 that included revision of the service area to include UGAs, resolved boundary conflicts between systems, and provided potential for joint facilities.

Another supplement was adopted in 1996 that applies to all public water systems within the designated urban water supply service area, including Lacey, Olympia, Tumwater, South Sound Utility, and the Pattison and Meadows water systems. Under this plan, the county ensures compliance with the policies of the entire service area. Policies include design standards for system components (pipes, storage, fire hydrants), boundary system adjustments (conforming to the adopted UGAs) and limitations on additions to more than 200 private, small water systems.

Requirements of DOH water plans

In accordance with the 2003 Washington State Municipal Water Law, DOH approves plans for all public water systems. Water service for any new industrial, commercial, or residential project must be consistent with the requirements of comprehensive plans, land use plans, and/or development regulations.

DOH annually compiles a list of water system plans to be reviewed in the following year, consults with other state agencies, and coordinates plan reviews.

Water utilities must develop a comprehensive plan

for each water system under the drinking water statute RCW 70.116.050. Plans project future demand for additional water connections. They estimate the flow capacity, which is the amount of water each system may withdraw, based upon the water right certificates issued by ECY. There is no data collected on the amount of water drawn from exempt wells.

However, since Thurston County generally does not provide water service, it does not engage in a planning process for water to serve future population growth in its rural areas. Moreover, there is no data collected on how much water is withdrawn from exempt wells.

Although DOH requires a water quality plan that includes figures for approved connections, the numbers in this plan might not constitute a legal limitation on the number of customer connections that the utility may serve. ECY has interpreted the 1993 municipal water law to mean that a water right, permit, or other document is not a limit on total connections. This interpretation allows utilities to expand their number of connections through water conservation.

Residents within the UGA expect the convenience of water, and municipal utilities believe they have a duty to serve.

North Thurston County groundwater management plan

In 1992, the North Thurston Groundwater Management Plan was adopted with a primary focus on water quality. This plan revised the 2030 projected demand for water and concluded the supply would be adequate. This plan concluded that there appears to be sufficient groundwater available within the water supply reservation boundary to serve North Thurston County's planned growth for the next fifty years.

In the groundwater quantity section of the plan, the first object was to ensure that "a long-term groundwater monitoring program is established." That has not happened and there has been no update to the plan during the last ten years.

NEEDS ANALYSIS AND DATA GATHERING

Forecasted demand

In developing a DOH mandated utility plans, various water utilities may use different data for forecasting water demand to keep up with projected population growth. Utilities are on separate schedules for updating plans, although every six years is required. Projections are difficult to compare and correlate because the timing of each is different. Forecasted demand is crudely calculated and expressed in terms of millions of gallons per day (gpd) needed to serve population growth as projected by TRPC. These estimates use limited data available from the utility's water comprehensive plan. Assumptions are not always clear and public involvement is not regularly sought. It becomes difficult for interested citizens to evaluate material for errors and provide comments.

The 2006 report of the Thurston County PUD states that countywide demand in 2005 was 26.7 million gpd, based on a population of 224,000. The report estimated water demand in 2050 for a population of 478,000 to be 56.7 million gpd.

Climate Change

The University of Washington's Climate Impacts Group studying weather trends in the Pacific Northwest, developed models for Washington that project increased temperatures. Warmer temperatures mean less winter snow-pack, earlier spring runoff, hotter summers and an alteration in natural water supplies. Precipitation might remain the same, but more precipitation will fall as rain, and storm events will be more intense. The likely effects on our rivers and aquifers include increased in-stream temperatures, more variation in flows, and seasonal depletions. These changes will put stress on our water supply and will necessitate more intense management.

Climate impacts could accelerate population growth trends. Currently, Washington's population totals 6.5 million. OFM currently estimates that population will increase by approximately one million by the end of the decade and climb to over eight million by 2025.

These estimates do not account for possible increased population from migration due to climate change. Thurston County's water supply, already challenged by a rapidly growing population, will continue to be strained.

Climate change, and human responses as it accelerates, may bring about changes in aquifer recharge patterns. There is growing interest in using aquifers for water supply and storage.

Water connections

The number of water connections of a utility is measured by equivalent residential units (ERU). An ERU is a unit of measure based on the average amount of water used by a residential customer. It is typically expressed as gallons-per-day (gpd). Larger quantities that businesses and institutions use is converted to multiple ERUs to track water availability within the system.

Cities, under a controversial 2003 state law, may expand water rights as population grows without considering previous or senior rights.

Data adequacy

Although Washington has separate laws for ground-water and surface water, state law recognizes the connection between the two. After groundwater comes out of the ground, it becomes surface water, and vice versa.

Data are fundamental to basic understanding of the hydrologic character and use of water resources. An adequate database does not now exist. ECY's data collection program remains understaffed and underfunded, but ECY is in the process of putting well connection and water rights data online.

Federal environmental programs are often delegated to state agencies without the federal government providing adequate authority or funding for the

agencies to complete those tasks or enforce the regulations. The disconnect between the existence of regulatory policies and the reality of enforcement makes it difficult for Washington state agencies like ECY to monitor water quality and quantity.

Federal data regarding the status of water resources in Washington State exists, but it is not comprehensive. Despite limited understanding of the hydrologic flows in Washington, homes will be built, the population will increase, cities will grow, and commerce will continue all expecting an adequate water supply. Whether these expectations will be met depends on our actions today.

Anticipated population increases and climate variation will add stress on water resources. Policies to allocate increasingly scarce water resources will require comprehensive data. Ground and surface water data, water metering, hydrogeologic interpretation, and mathematical models are critical to understand the character, distribution, and trends of our water resources. Three data sets are needed to develop a good model: surface stream flow gauging, groundwater monitoring and water usage metering.

1. Stream gauging

ECY and U. S. Geological Survey (USGS) maintain stream gauges on some rivers in Washington. Stream gauging provides flood and water supply information, a means to monitor compliance with in-stream flow requirements, and data to use in making decisions on the allocation of water between users. Due to funding constraints, the USGS is pulling some gauges out of the state. In response, ECY is evaluating the need to replace federal gauges and increase coverage.

2. Groundwater monitoring

Groundwater is a critical resource as it supplies most of Thurston County's drinking water and over 60 percent of the drinking water in Washington State. Groundwater and surface water are often a single, interconnected resource. Increases in groundwater withdrawals can result in reductions of both surface flows and recharge to aquifers. Currently the state has no consistent program to monitor or characterize large-scale ambient groundwater conditions. Ap-

proximately half of the states in the nation have groundwater monitoring programs, in many states mandated by the legislature.

The USGS conducts a comprehensive set of daily measurements of groundwater depths, stream depths, velocities, and meteorological data such as rainfall on a daily basis. There are monitoring sites within each county.

There have been about 77 groundwater studies across the state in the last 20 years. ECY's four regional water resource programs monitor groundwater levels. They do not regularly monitor groundwater quality and there are no linkages between water quantity and quality. Finally, the USGS, counties, large municipalities, tribes, and DOH are monitoring some groundwater. Groundwater monitoring is generally carried out by private consultants, some of whom might be biased toward the desired result of the hiring entity.

In Thurston County the total amount of groundwater usage is not known. Monitoring water is the first step in any practical water management plan. Is there enough water for the predicted population increase to 478,000? How is it possible to know the answer if there isn't an accurate account of water available to the current population?

3. Metering water usage

Metering is essential to evaluating the effectiveness of water conservation. State law requires metering water users in the 16 fish-critical basins identified by ECY, including the Deschutes and Nisqually Basins in Thurston County. ECY was forced by a successful lawsuit to implement this law. Expanding metering to areas where water is overappropriated or in short supply would aid in conservation. Metering helps answer several important water management questions:

- Is water available in specific areas to serve new uses?
- Are water conservation incentives effective?
- How does existing water use affect other users, source waters, and the transferability of water rights?
- Are water users in compliance with water permit requirements?

Metering is now required for most municipal utilities. Thurston County requires metering on the allowable limit of three connections per well, but there is litigation pending against Yelm that claims this requirement is not enforced. Where metering is in place, consumption by each customer can be tracked for conservation purposes. Different rates can be charged for varying water volumes used during the billing period to provide an incentive for customers to conserve.

No data, however, have been collected to determine the amount of water being withdrawn from exempt wells.

Metering might not measure all water use. Water usage can be expected to exceed the simple product of ERUs and connections because of system loss and events such as fire fighting, pipe breakage, system flushing, and street cleaning. Most municipal systems waste or lose track of 12 percent to 18 percent of their annual withdrawals.

GROWTH RESTRICTIONS BASED ON WATER AVAILABILITY

Lacey

Lacey's applications for water rights have been pending with the Department of Ecology (ECY) for years. The approval is stalled because further groundwater withdrawals will affect surface water flows. For ECY to approve a new water right, the city is required to develop a mitigation plan to offset those impacts. Developing the mitigation plan has evolved into a regional coordination effort that includes the cities of Olympia and Yelm and the Nisqually Indian Tribe. To stretch available water supply while waiting for new water rights, the city has set goals for reducing per capita water usage. Strategies include: adopting a tiered water rate schedule, mandating limitations on summer watering, providing for the use of reclaimed water, providing water conservation services to its customers, and establishing a leak detection and pipe replacement program.

Despite these efforts, Lacey stopped issuing water availability letters for development in its unincorporated Urban Growth Area in May 2005 because it couldn't guarantee that it had an adequate water supply to serve new customers. This de facto moratorium has prompted some impacted property owners in Lacey's UGA to consider options for obtaining a source of water supply for their projects. Some developers have requested annexation, without success, in order to get water service from the city. Others are exploring water service with exempt wells or from adjacent water systems.

The city developed three options whereby they could

provide future water service in the UGA. These were formally adopted in a resolution passed in December 2006.

The city's preferred option is that the owner or developer contribute sufficient water rights to Lacey to serve the property. ECY must approve transfer of the water rights to one of the city's existing wells.

As a second option, an owner or developer of the property can enter an agreement with the city, which commits to the use of reclaimed water for all irrigation and toilet flushing. This option requires that the supply of reclaimed water is sufficient to offset the proposed use of potable water. An owner or developer must pay in advance for the necessary reclaimed water infrastructure. A third option authorizes the city manager to seek agreements under the CWSP for provision of temporary water service by other water purveyors. Under this system, Olympia agreed to sell water to Lacey for two years starting in May 2007.

Rural Thurston County (six-packs)

State law, dating from 1945, provides an exemption from the permitting process if water use is less than 5,000 gpd. However, the law requires a construction permit for such wells. State and local jurisdictions lack personnel to enforce these requirements.

Developers found that they could put six homes on a permit-exempt well. DOH estimates 800 gpd is required for each home and hence six households

could be served by the 5,000 gpd allowed for each exempt well. This set-up is called a six-pack. Six times 800 is less than the allowed 5,000 gallons.

Developers came to rely on this exemption to provide water for rural subdivisions, using multiple exempt wells within a subdivision. The practice was challenged in 1999 in connection with a development in Yakima County where the developer applied for permits to construct 20 exempt wells for all of Rambling Brooks Estates. In *Department of Ecology*

v. Campbell & Gwinn, LLC, the Washington Supreme Court held the exemption did not apply to a group of wells constructed as part of a single development. This decision may require builders to find other ways to provide water to rural subdivisions. If legislatively implemented, it could mean rural home construction will be restricted by lack of water availability. Again, at this time no agency is specifically funded to enforce these standards. Local elected officials could legally refuse to approve plats where the intention is to serve water through a series of six-packs.

CHALLENGES

Population growth, pollution and climate change are major threats to our water supply. Is population growth inevitable? Might the finite supply of water eventually limit growth? Are preventive measures possible? Will unbridled competition for this essential resource leads to fighting over what water is left? At what point will the demographers, GMA administrators, and state and local elected officials acknowledge that limited water supply and growth policies need to be considered together?

During the water study, members of the committee read plans, books and reports, researched web sites, listened to speakers, and participated in discussion sessions. Many knowledgeable people gave generously of their time to talk with the committee, to raise serious issues, and make policy suggestions. Below, we are sharing some of the suggestions.

Precautionary Principle

Under the state's water laws, there are steady conflicts between out-of-stream allocation of water and protection of in-stream uses of water. The four statutory criteria which ECY must take into account in the granting of water rights need more attention and clarification: availability of water, beneficial use of water, impairment of others' water rights, and public interest.

Because it is frequently very difficult for ECY to determine whether water is available for new uses, ECY has closed some areas to the issuance of new

water rights. Strong enforcement of the "use it or lose it" principle in water law could result in the relinquishment of unused water rights back to the state. Several benefits would result: improved stream flows, less water hoarding and more water available for additional beneficial uses by other persons.

Prudent leadership errs on the side of caution. The Precautionary Principle requires that in determining a course of action, the worst potential outcomes are considered in making a decision. For example, if it is possible to run out of water in Thurston County, the prudent action might be to freeze issuance of water rights, increase conservation and efficiency, reduce the allowed capacity of exempt wells to that which a single family home would need, mandate low-impact development, require concurrency between land use and water supply planning, implement state water laws, and increase funding for administration and enforcement of water laws already in place.

Exempt wells

Historically, exempt wells were not expected to pose a problem. In rural areas, after a household's typical use, most water goes back into the ground to recharge the aquifer. In urban areas, much used water goes into the LOTT sewage treatment system or into stormwater runoff. Either way, it goes out to Puget Sound. As population increases, more water is withdrawn from aquifers.

Unplanned and unmanaged proliferation of exempt wells creates an environmental and developmental

obstacle. Data indicate that 75,000 exempt wells have been installed statewide since 1993, increasing the use of groundwater. Groundwater, a natural resource, recharges slowly. Using it unwisely depletes supplies, harms other water rights holders and limits growth. Knowledge of the quantity of water being withdrawn by exempt wells is essential to determine whether aquifers are being depleted.

Legislation could provide oversight of new exempt wells. It is important that subdivisions now using exempt wells for six homes, or multiple six-packs, be required to meter consumption and report to ECY, along with the DOH regulation to which they are already subject.

A more comprehensive solution would be to modify or eliminate the exempt well category.

Planning

Local water planning efforts should be better coordinated, integrated, and in some cases merged. There are multiple watershed plans, water reservation plans, Coordinated Drinking Water Act plans, municipality water utility plans, well head protection plans, storm water management plans, Puget Sound water quality plans, sewage effluent plans, water reuse plans, and others, which go uncoordinated.

A clear link between the state water allocation and management programs, and GMA planning and other land use planning could provide a better understanding of water consumption and enable better policy choices. State population growth projections and local planning could take into account water supply as an essential element for growth Decisions. All water supply plans could include strong, effective policies to guarantee water conservation, water reuse, and reduction of water waste through leaky pipes, as well as prevent poor usage. Another effort to adopt a watershed plan for the Deschutes River could ensure that the river maintains adequate in-stream flows for fish and wildlife.

Governments in Thurston County could develop a countywide water management plan and comprehensive strategy, including monitoring groundwater supplies, developing additional storage capacity, and assuring water quality protection. Jurisdictions could

fund and implement groundwater monitoring.

Water registered as property

Water rights are a “right to use” rather than a “right to own.” It could be made a standard requirement that water rights be recorded as a property right with the county auditor whenever a transaction occurs. Many do record water transactions with the county auditor as a means of protecting their lawful claim. The Real Estate Excise Tax applies to sales of water rights, just as it is on other property transactions, but compliance levels are unknown.

Concurrency

The GMA requires concurrency for transportation projects. This means that if buildings are proposed for construction, the local government must determine if added traffic will affect the established level of service. If traffic will significantly increase, the government must (1) increase road capacity, (2) lower the standards for traffic in the area, or (3) deny permission for the additional building. There is no equivalent concurrency requirement for water supply in relation to population projections. Currently, new users may be added to a system with the belief that there is water available. Without proof of water availability, a building permit should be denied.

Funding

Many laws passed by the Washington State Legislature are not being implemented or enforced for lack of funding. Further, there is insufficient funding for basic research. Investing in monitoring and enforcement could achieve large conservation gains at a relative low cost. Similarly, many plans adopted by local governments are not being implemented for lack of adequate funding.

Market approach

“Water is too valuable to be managed by a market.” This attitude accounts for many of the water dilemmas that face the state. The high cost of our nonmarket approach to water management will become increasingly evident as population increases

and climate changes. It is imperative to distinguish between markets as masters and markets as tools. Any use of water markets must acknowledge the public ownership of water under the Washington State Constitution.

Use of water resources is virtually free in Washington. The price paid by water users reflects, not a fee for water itself, but the infrastructure required to pump, store, treat, and deliver water. The charge by ECY for a water right is a small fee that does not even cover the cost of processing the request. The processing costs are paid by taxpayers through general revenues.

Water conservation has had limited success. Higher water use efficiency always has a real price. For example, treating and pumping wastewater can be expensive. With water available for zero cost, there is no logical economic reason to invest in water reuse.

The existing approach to water management assigns ECY to enforce water use efficiency. ECY has the statutory authority to reduce an existing water right to force the holder of the water right to stop wasting water. However, without knowledge of the amount of water used, it is difficult for regulators to take enforcement action. Moreover, the regulatory agency is subject to influence by those with political power and a desire to protect their water use.

A market approach to water management does not mean letting water flow to money. A water market system consistent with the State Constitution and with existing state statutes would first recognize the public ownership of the water resource. In order to sell something, you must own it.

Within each major water user group, a water marketing approach would use pricing to allocate water. Pricing would be regulated. The law would determine through public process the allocation of water for human consumption, environmental protection, fish habitat, recreation, quality of life and for all other beneficial water uses. Any politically realistic water marketing approach would need to ensure all individuals a basic allocation of water regardless of ability to pay and would need to protect against any individual, corporation, or consortium from exercising influence over the market.

Opponents to the market approach recognize that water, as a human right, like air, cannot be commercialized. Trading water rights with ones neighbors may be appropriately regulated. As a publicly owned resource, it is inappropriate to sell. In no instance has private ownership lowered the market price. This is true of water, as well. Water may not be owned and enrich the few at the expense of the many.

Conservation

Water is a finite resource. No means of extending the use and expanding the supply of water can match the cost effectiveness of conservation. Olympia has done a superb job of helping its water customers conserve. Olympia experienced an increase of 3,500 water hookups between 1996 to 2004. During that time water usage actually declined by 300,000 gpd due entirely to a change in consumption practices. Thurston County's water future includes aggressive conservation programs.

An economic incentive to conserve, such as graduated water rates, has been effective. Four times more water is used in areas where rates are both flat and low, compared to areas where rates are structured to increase as water use increases.

Low impact development

In a water study, Whidbey Island League of Women Voters recognized that the large footprint of current building construction is harmful to underlying aquifers. Low impact development allows a community to accommodate growth while preserving its environment. Water gardens, roof vegetation, and reusing water are a few examples. These procedures save construction and utility money. They are allowed in Lacey and Tumwater and required in the Cooper Crest subdivision of Olympia. Thurston County could mandate low-impact development.

Groundwater is a vital natural resource. Using it unwisely threatens our economy, limits growth, and undermines the quality of our natural resources. Water, like air, belongs everyone, not to corporations or governments, or one individual. Vigilance on the part of the citizens of Thurston County is necessary to manage it in the public interest.

ACKNOWLEDGEMENTS

Marilyn Funk and Karen Verrill, as co-presidents, were tirelessly supportive of the study. Special thanks are readily given to Carole Wahlers for her copy editing skills. Our readers were Herb Fuller, Bill Funk and Streater Johnson, whose suggestions were important to the report. Pete Swensson, Mark Swartout and Brian Walsh provided much needed technical help.

GLOSSARY

CWSP	Coordinated Water Systems Plan
DOH	Department of Health (WA)
ECY	Department of Ecology (WA)
GMA	Growth Management Act
gpd	Gallons Per Day
LWVTC	League of Women Voters Thurston County
LOTT	Lacey, Olympia, Tumwater & Thurston County Wastewater Alliance
OFM	Office of Financial Management (WA)
PUD	Public Utility District
RCW	Revised Code of Washington
TRPC	Thurston Regional Planning Council
UGA	Urban Growth Area
USGS	United States Geological Survey
UTC	Utilities and Transportation Commission (WA)
WRIA	Water resource Inventory Area

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