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| Drinking Water in Clackamas County - Part IICo-chairs Sarah Chaplen and Christine Roth | Committee members Susan Macomson, Kathy Newcomb and Sylvia SmithDrinking Water Study MapIntroductionThe Clackamas River watershed is the major municipal water source for most of Clackamas County. Originating in national forests, the water is presently of high quality. The major quality problem is periodic turbidity caused by both nature and by human activities. However, forest practices within the forested two-thirds of the basin and growing urbanization within the lower one-third of the watershed may produce further non-point pollution problems as time goes on, and may affect the fluctuations in water volume, too. There is a need to continue to minimize the effects of urban needs and forestry practices on stream and riparian habitat, wildlife, and fish, particularly migratory species of fish which are already threatened.The volume of river water available, particularly in the low flow season of August through October, may not be enough for all decreed beneficial uses. Slope and soils within the watershed are not generally favorable to the rapid accumulation of groundwater to be accessed through wells. Finally, stored water, for purposes other than hydroelectric generation, is currently limited to only a small part of Timothy Lake.Many stakeholders have vested and conflicting interests in the watershed. However, those stakeholders in conflict on one issue may well be in alliance on another. Water rights are heavily subscribed. The question of both present and future in-stream rights, both present and future, hangs over future water rights applications. Municipal water rights are large and often not fully used. They have certain rules which make use of water and retention of unused rights easier than for other rights holders. Thus, these rights to a scarce resource can be a source of contention. Portland General Electric’s (PGE) hydroelectric generating rights are the most senior on the river, and are currently under adjudication – a very lengthy procedure. So is the current federal hydro relicensing process, which may eventually result in PGE’s having to give up some water for in-stream purposes |
| Description of the Clackamas Watershed (Basin)The Clackamas River Basin forms a substantial part of the greater Willamette River Basin, which itself forms part of the Columbia River Basin. Nested within the Clackamas River Basin itself are 16 sub watersheds, each comprised of interrelated streams, riparian and uplands. Each sub watershed is important in maintaining the health of the whole.The watershed drains more than 940 square miles or 600,700 acres including the southwest slopes of Mt. Hood. The river begins on Olallie Butte, a high Cascade volcano located in Marion County. It flows 82.7 miles from its headwaters (elevation 6,000 ft.) to its confluence with the Willamette River between Gladstone and Oregon City (elevation 12 ft.). The river drops nearly 3,000 feet in its first three miles and by river mile (rm) 40, as counted from the river mouth, its elevation is about 1000 feet.The Basin Concept is important. The Oregon Water Resources Department (OWRD) adopts basin programs to set policies for managing all the land areas, surface waters, aquifers and tributary streams that drain into a major namesake river. The OWRD's basin water master is in charge of water rights administration, arbitration, water measurement, and other basin programs and activities. The goal is the highest and best use of water resources. Under the Willamette Basin Program adopted in 1992, the main stem of the Clackamas River from North Fork Dam (near rm 30) downstream to the mouth is classified differently according to the season. These classifications apply only to water permits granted after August 29,1992, not to rights and permits granted before that date. From July I through October 30, the river is classified for domestic use, modest commercial use, municipal, livestock and instream uses. From November I to June 30, the types co of permitted uses are much broader. In addition, the OWRD has established "limited ground water areas" where additional pumping permits are restricted to a few uses around Sandy, Boring and Damascus.Substantial areas of the watershed have a moderate to high soil erosion potential based on slope, the composition of the underlying geology, the relatively low ability of water to permeate the soils, and the existing ground cover. Only a very few areas in the Clackamas Basin have soils with a rapid water infiltration rate. The upper two thirds of the basin has mostly a moderate to slow infiltration rate, while the lower one-third rates are slow to very slow. Thus, surface water run off tends to be rapid, and accumulation of ground water (for wells) rather limited. Soils in most areas scheduled for development within the Urban Growth Boundary (UGB) and the Urban Reserves (UR) are in the slow to very slow infiltration rate categories.Land cover within the basin varies, nearly three-fourths of the land being forested. Only 3.3% of the basin's acreage is used for agriculture, while 20.46% is not forested. The 1990 census classified only 3.13% as urban, i.e. using the US Geological Service (USGS) definition of having a population of 1000 or more persons per square mile. As of this writing, comparable data from the 2000 census is not yet available to Metro, but the percentage will probably increase.  |
| Property Ownership in the WatershedClackamas River Watershed can be roughly divided in half with nearly all the upper watershed in the Mt. Hood National Forest, managed by the United State Forest Service (USFS). Most of the lower watershed is privately owned with the intermediate area, including parcels owned by the United States Bureau of Land Management (USBLM) and private timber companies.Within the Mt. Hood National Forest, there are scattered private holdings, including those of Portland General Electric (PGE) on the North Fork of the Clackamas and Austin Hot Springs on the upper Clackamas. There are parks owned by Clackamas County (Barton, Eagle Fern, Metzler) and small state-owned parcels, the largest being McIver Park. |
| Human Impact on the WatershedIn 1995 Metro demographers estimated the watershed population at about 64,000.The number of residents is growing as is the number of municipal water consumers (about 175,000 including some of the 64,000 residents but not all), and those using the area for recreation. Metro has adopted 4,468 acres of urban reserves (UR) within the watershed, while Sandy has reserved 2,148 additional acres. Another 6,979 acres lie within the Urban Growth Boundaries (UGB) of Metro, Sandy and Estacada. On August 1, 2002, Metro Executive Mike Burton presented a proposal for a 10,200 acres expansion of the UGB in the Damascus area. About 84 per cent of that space would be residential and the rest would be commercial. Gresham would be allowed to develop 2,700 acres within the UGB, primarily on the south side, adjoining the Damascus expansion. This translates into a population expansion of 50,000 to 150,000 people. Oregon City would be permitted to develop 1,400 acres. For example, the population of Beaverton is about 76,000, Lake Oswego 35,000, Oregon City 27,000, and Gresham 91,500. (Further discussion will take place in Part III of this study. |
| Run-off/Pollution/DischargesOne consequence of urban development is the creation of impervious surfaces, i.e. a surface not easily penetrated by water, such as streets, parking lots, building roofs, compacted soils with reduced vegetation. In areas that already have fast surface run-off the consequences include the threats of additional flooding and increased waterway and groundwater pollution. Both of these could easily damage aquatic and riparian habitats, and therefore fish and wildlife. The accompanying chart illustrates the percentage of impervious land surface created by various types of development.**Table 7** Clackamas River Watershed Atlas, pg. 25

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| **Estimated percent of impervious surface by land-use\* type** |
| Property class description  | % impervious |
| Open space | 5% |
| Single-family residential, vacant  | 5% |
| Single-family residential, improved(roads and rights of way are calculated separately) |   |
|   | 0 to 0.25 acre0.26 to 0.5 acre0.5 1 to 1.0 acregreater than 1.0 acreaverage | 35%3 %25%20%27.5% |
| Commercial land, vacant Commercial land, improved | 5 %90% |
| Industrial land, vacantIndustrial land, improved | 5%90% |
| Department of Revenue appraised industrial  | 90% |
| Tract land, vacant Tract land, improved  | 5%20% |
| Farm land. vacant Farm land, improved  | 20%20% |
| Forest land, vacant Forest land, improved  | 5%2% |
| Multi-family residential, vacant Multi-family residential, improved | 5%65% |
| Mobile home park | 60% |
| Recreation land, vacant Recreation land, improved | 5%20% |

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\*Land uses as defined by the Clackamas County property classification for assessment (PCA) system.A second consequence is the need to treat or dispose of a greater volume of wastewater before it joins the waterways. Part of the Clackamas County Commissioners’ concerns detailed in their August 28,2002 letter to Metro was about the difficulties of adequate planning for sewage treatment in the Boring-Damascus area unless certain additional areas were included in the UGB. Septic tank failure is always a concern, particularly from areas like mobile home parks and campgrounds.Up to now, the river has been reasonably well protected from point source pollution.There are no major DEQ permits on the Clackamas River. A major permit is roughly defined as effluent exceeding 1 million gallons per day (MGD) or from a population of over 10,000, or relating to a complex effluent.Between rm 6 and rm 51 there are approximately 11 Department of Environmental Quality (DEQ) non-major permits for the main stream and tributaries. Those permits include:* Domestic sewage: Sandy (population 6,000) returns treated waste on a seasonal basis into Tickle Creek, a tributary of the Clackamas River. Estacada (population 2,600) returns its treated water to the Clackamas River. Estacada Mobile Village and the Civilian Conservation Corps at Timberlake also have non-major permits for discharge of wastewater. Boring has a small lagoon and sand filter treatment process which the County regards as a ‘potential problem’ (August 28, 2002 letter to Metro).
* Mostly treated discharge from three fish rearing facilities.
* Stormwater discharge from a hazardous waste cleanup business in Clackamas County.
* Emergency overflows from two sewage treatment plants that normally discharge into the Willamette. They are the Gladstone pump station #11 and Kellogg Creek Sewage Treatment Plant station #1 on SE 142nd Street, both close to the mouth of the Clackamas River.

Under DEQ’s Three Basin Rule, no new discharges of these types have been permitted as of January 28, 1994.The DEQ also issues lesser permits under a “general” category, some of which may be temporary. They are probably the least regulated of the permitted discharges.Non-point pollution exists but perhaps not in the volume found in the more agricultural areas of the Willamette Basin, or where river flow is slower. The number of ‘farmettes’ and small holdings in the lower third of the Clackamas may cause problems as inexperienced or disinterested residents may fail to control surface water run off, or pollution from animal discharge, or may fail to fertilize correctly and by doing so cause groundwater infiltration. Some of the areas where this type of land use prevails are those to be included in the expanded UGB.Nurseries and other specialized agriculture are found on the north side of the Clackamas Basin in the Sandy-Boring-Damascus area, and south of Gresham. These may be users of grey water in low waterflow seasons. They closely monitor their use of fertilizers and pesticides. On the south side of the Clackamas and in the mid-reaches of the river are many of the 4500 tree farms in Clackamas County, including some of the 350 Christmas tree farms.The demands of municipal (treated) water and electricity create further difficulties. The first difficulty is maintaining an adequate supply of water for all beneficial uses during the summerfall peak demand season, which is also the low water supply period. With the exception of Estacada all major municipal water intakes occur within the first eight river miles from the confluence with the Willamette River. During shortages those with junior water rights (of which more later) are most likely to suffer, including fish and wildlife. Secondly, reduced water volume increases the risk from poIlutants as sediments are exposed and toxics concentrate. The thirdproblem is maintaining a stable water temperature for aquatic and riparian wildlife. In addition tothe risk of temperature increases from reduced water volume, water returned to the river afterbeing diverted to generate electricity is somewhat warmer than before. In this case, fall migratingfish are particularly exposed to dangers, but other aquatic life is extraordinarily sensitive to small temperature changes.Unlike the Willamette River Basin, the Clackamas River has no sizeable dams or reservoirs for water storage/flood control. Timothy Lake stores water for PGE electricity generation but is too small to store sufficient water for all peak- use-season emergencies, although a certain amounthas been contracted for release to protect instream needs.Finally, growing recreational use in urban areas increases the exposure of the watersheds to degradation as the result of sewage, roads, fuel pollution on and off the water, and disturbance of the riparian and water environments. The sheer inaccessibility of much of the Clackamas watershed somewhat limits the impact of recreation. The lower one-third of the system is most affected by recreation. |
| The Upper Watershed**Characteristics of Forest Watersheds**Water quality in Oregon forestlands is generally is high, although some dissolved particles and biological constituents are commonly present. Turbidity, manmade or natural, is a major concern to water purveyors.Forest cover typically stores and uses water (15-20 inches annually) through canopy interception, transpiration and taking it from the soil. Because of limited water storage in shallow upland soils, peak flows from forested watersheds often follow heavy rainstorms or snowmelt. High sediment levels can occur in streams within undisturbed forest watershed, especially during heavy storms. However, according to Tillamook District Forester Mark Labhart, roads have the greatest effect on erosion and sedimentation.Forest fires can have an impact on the watershed and its waters. Effects can range from little damage to total destruction of trees and ground cover. In the case of severe fires, soils can be aked to the degree that seeds are destroyed and the resulting hardpan can take decades to fully recover. Negative effects can include:* Reduced water infiltration
* Increased water run-off
* Increased erosion

All of these factors add to water turbidity. There is also increased potential for flash floods, landslides, and debris flows.Loss of soil nutrients, higher stream temperatures as forest shade is lost, and increased potential for noxious weed invasion can have a detrimental effect on aquatic and riparian life, and ultimately in the health of the watershed.There is currently intense discussion about how to limit the severity of forest fires. Mandatory inventory of affected species and concern for endangered species has slowed logging permitted under the federal forest plans. If, how, where and when to thin are all controversial topics, as is the exact composition of interested parties to be included in negotiations.**Effects of Forest Practices on Water Supply**Forest management theories and practices have changed over the decades and are by no means without controversy. Special interests with conflicting goals are plentiful. Components of the timber industry and environmental groups are often at loggerheads. Policy and administration is divided between federal, state, county, and local agencies. Action is frequently left to individuals, interested groups and private landholders. Official/public funding for research and for monitoring is variable, and usually not enough, while special interests may be well financed.For the US Forest Service (USFS) and the US Bureau of Land Management (BLM) lands in the upper part of the basin, existing land uses are defined as those outlined in the Northwest Forest Plan, the Mt. Hood National Forest Plan and the BLM Resource Management Plan. Areas of land designated as matrix lands allow timber harvest on a regulated basis while retaining some forested land to allow wildlife to travel. (See Glossary for other land designations)For instance, in the Mt. Hood National Forest (of which the Clackamas Basin forms roughly one half) about 45% or 484,350 acres are currently designated matrix lands. After removing riparian reserves and unsuitable (unstable) areas, only about 204,000 acres remain available for harvest. No timber was offered for sale in 2000 because of an August 1999 Circuit Court ruling that field studies of several plant and animal species must be completed. However, timber from previously completed sales was cut in 2000.Nine of the 16 Clackamas sub-basins are about evenly divided in area between matrix lands (managed harvest) and designated non-harvest areas. Estacada is approximately in the center of the managed forest harvest areas.There are two general methods of management and harvest in Oregon known as even-aged (clear-cut) and uneven-aged (selective harvest). Selective harvest management is more favored for use in the more extreme climate of eastern Oregon. However, the current Mt. Hood National Forest Plan encourages the move away from straight clear cut methods towards a mix of harvest methods. In fiscal year 2000, for a commercial harvest of about 39.4 million board feet, the harvest methods were as follows: commercial thins 50%, selection cutting 26%, shelterwood 11%, sanitation/salvage 8% and clearcut with reserve trees 5%.The even-aged system has been the most common system for regrowing Douglas firs. While the initial planting may contain other types of seedlings, the firs dominate. Thinning or limited harvest may occur at intervals of decades. The final harvest occurs between forty and eighty years when the trunks are 12 to 30 inches in diameter. This is the clear-cut. In fact, many of these plantations are better considered farms rather than forest habitats. Their monoculture establishes a very limited environment for natural wildlife and may be prone to pests and diseases needing to be controlled by chemical methods. It should be noted that only two mills in Oregon are set up to cut logs with a greater diameter, meaning that it may be relatively more expensive to process larger "old-growth" logs.The threat of increased run-off, erosion, turbidity, and chemical pollution can be somewhat offset by attention to riparian boundaries and good forestry practices. **The Oregon Forest Practices Act (ORS 527) and the Oregon Department of Forestry Administrative Rules and Practices (Divisions 600-680) control the forest management and harvest on non-federallands within the state. Several divisions deal with water protection. Others concernharvesting, road construction and maintenance, use of chemicals and other petroleumproducts as well as planning, stewardship, reforestation, site protection, treatment of slashand other issues.** |
| Allocation of Water Resources**Ownership and Management of Water Resources**In Oregon all water is publicly owned and managed by the Oregon Water Resources Department (OWRD). The Department operates under the policies established by the seven-member Water Resources Commission (WRC). The Watermaster’s Office provides administrative functions to support and enforce the water code.The Watermaster's Office is part of the Field Services Division of OWRD. There are twenty Watermaster Districts statewide, organized into five regions. The Watermaster functions as a local contact for landowners, elected officials and watershed councils, as well as other government agencies at the local, state, and federal level. In addition, the Watermaster and his or her staff conduct streamflow measurements and maintain gauging stations; conduct well inspections and collect groundwater level data; perform routine dam safety inspections; assist in stream recovery efforts; provide information to landowners and others on water rights and Oregon Water Law; regulate water use during times of shortage and mediate disputes between water users.**Vested Water Rights**If water was used before the enactment of the 1909 laws and has been used continuously since then, the property owner may have a "vested" water right. Since a water right is attached to the place of use, this is true even if the ownership changes. A vested water right claim can be determined and made a matter of record only through the adjudication process. The OWRD gathers information with public input and presents its findings to the circuit court. The court then issues a decree stating who has the water right and what is its priority date. The OWRD thenissues water rights certificates for each decreed right. The priority date is usually the date the project's construction began or the date of the first use of water. While adjudication is going on, pre- 1909 claimants may appropriate water as in the past, but they are not entitled to the benefits of OWRD enforcement procedures.**Water Storage on the Clackamas**Portland General Electric has three pre-1909 hydroelectric claims on the Clackamas River, the Cazadero/Faraday Project on Timothy Lake, the River Mill Project, and the Oak Grove Project. Claims total 7613.5 cfs. Currently these claims are under adjudication. All of them are upstream of the municipal water diversion points, with the exception of those of the South Fork Water Board on the South Fork of the Clackamas and Memaloose Creek.Water is stored during the spring snowmelt when Timothy Lake is ten to fifteen feet below full pool. After the lake is filled, sometime in June, it is kept full for recreational use but no further water is withheld from stream flow. From the first of September through early October, the outflow is increased. At a volume averaging 200 cfs. The natural flow can be augmented for about a month.There is the potential for water from Timothy Lake could be used for municipal and industrial purposes, if current instream needs were met and there was water that PGE didn't need. There are also studies and discussions about developing additional storage for these uses. Major renovations and expansion of the dam would be costly. Attention would have to be paid to modem requirements for fish migration and other downstream concerns.Furthermore, PGE's dams on the Clackamas are currently up for relicensing by the Federal Energy Regulatory Commission (FERC). This is a long process that may begin as much as ten years before the renewal date because numerous interested agencies have to be consulted. Agency relationships may, or may not, be amicable or their interests compatible. One area of negotiation is the volume of flow on the Oak Grove Fork of the Clackamas below Timothy Lake where PGE currently has sizeable diversion rights. Other agencies feel that instream flow should be increased.**Oregon Water Code**The Code of 1909 contains four fundamental provisions:1. Surface or groundwater may be legally diverted for use only if used for a beneficial purpose as defined by the OWRD.
2. The more senior the water right, the longer the water is available in a time of shortage. This is the *doctrine of prior appropriation*.
3. A water right is attached to the land where it is to be used, (appurtenancy) as long as the water is used. If the land is sold, the water right goes with the land to the new landowner.
4. A water right is valid as long as it is used beneficially and completely used at least once every five years. After five consecutive years of non-use, the right is considered forfeited.

*Municipal water rights are an exception. They do not have to be fully used or ‘perfected’. The rights may be held as use certificates indefinitely, subject to periodic OWRD review and, theoretically, periodic re-application for extension.***Water Use Restrictions**All waters within the state may be appropriated for use except those withdrawn by law or administrative order of the WRC. The WRC may classify and reclassify, all sources of water supply as to the highest and best use and specify the quantities to be used for the future in order to promote an integrated and balanced water management plan for the state as a whole. This process has the effect of restricting the type and quantities of water use to the highest and best uses identified in the OWRD's basin programs.*The WRC cannot adopt restrictions that reduce water rights that have been granted, so the restrictions apply to new water rights.***Water Dedicated to Instream Uses**The WRC sets perennial and seasonal stream flows and approves instream water rights for fish protection, pollution mitigation or maintaining recreational uses. Minimum stream flows and instream water rights have a priority date and are regulated in the same way as other water rights.These minimum requirements cannot affect a more senior rights holder's use of water. They are administrative rules adopted by the WRC and can be changed by the Commission. While minimum streamflows have been authorized since 1955, instream water rights were authorized by the 1987 legislature. The new state law allows the Departments of Fish and Wildlife, Environmental Quality, and Parks and Recreation to request instream rights from the Commission. Private water holders also are allowed to sell, lease or donate water rights to be converted into instream water rights.The Commission can subordinate instream rights to municipal rights through a drought declaration by the Governor. (see pg. 5)Applications totaling about 20 cfs are currently pending with the OWRD on the mainstream of the Clackamas River. The applications are for domestic and wildlife use and would be senior to subsequent municipal applications.New water rights can be applied for the Clackamas subject to water availability.**Obtaining Water Rights/Use Permits and Perfected Certificates**Water rights are obtained in a three-step process. First the applicant must be granted a water use permit allowing the holder to construct an OWRD approved system and start using water. When water is used, the permit holder must demonstrate that he is following the provisions of the permit. If that is shown to be so, the OWRD issues a final water rights certificate, i.e. perfects the right. A public process is followed before either a use permit, permit extension or the final right is granted.**Oregon Scenic Waterways Act**The Oregon Scenic Waterways Act, in addition to federal legislation, designates wild and scenic rivers. It requires that free-flowing water designated as scenic under the Act be maintained in quantities necessary for recreation, fish and wildlife. Thus before issuing a water use permit, the Oregon Water Resources Commission must have clear evidence that the proposed use of water would not affect adversely flows in any downstream state waterway. "Diack" flows, named after a 1988 Oregon Supreme Court case, "Diack vs. the City of Portland", are water levels meeting these criteria.If these flows cannot be met, new use permits cannot be issued.**Rights to Stored Water**Construction of a pond or reservoir of any size to store water requires a special permit to store water in excess of existing water rights. This means the water usually comes from surplus winter streamflow, Diversion of the stored water for use requires a secondary permit. The holder of stored water does not have to release it to satisfy older natural flow rights, however, the stream flow for prior downstream holders must be maintained as well as instream water rights or minimum stream flows.For example, PGE has a permit for stored water at Timothy Lake in the upper reaches of the Clackamas. At present if some of this water were to be purchased for municipal or instream use, the PGE permit would have to be modified accordingly. Unless an additional permit was granted for an additional volume of stored water, PGE's storage volume for its own use would be reduced. The new user would need to get permits for storage and a secondary permit for withdrawal. Timothy Lake is currently the major storage point on the Clackamas River system. The primary purpose is water storage for hydroelectric generation, but a certain volume has been contracted to improve flow downstream in August through October.**Transferring Water Rights**A water right is very specific. All changes must be approved by the OWRD, after the Department has determined that other rights holders will not be injured by the proposed change(s) and after the rights holder has proved that the right has been used continuously and has not been forfeited. The original priority date is not affected by the transfer. The holder must perfect (fully use) the transferred right and a new certificate is then issued.Currently, municipal users are not affected by the time requirement.As of late, municipal water rights are not quite so closely tied to place and type of use as long as it can be termed for “municipal use”. They may be used on any lands acquired by annexation, merger, consolidation, or by the formation of a water supply authority.A municipality may also use water on any land as long as it is for beneficial municipal purposes, and the changes do not harm prior vested rights. However, transferring diversion rights from one point to another is more complex and if the transfer interferes with established rights, it may not be possible. Thus, Oregon City may never get to fully exercise its water diversion rights on the South Fork/Memaloose Creek water system or to transfer its rights downstream to its existing diversion rights.**Out of Basin Transfers**Inter-basin transfers (out of basin) water transfers depending on the size of the proposed transfer, must be approved by the OWRD or the Legislature. This requirement does not apply to cities facilitating regional water service, if the water has been historically transported between the basin of origin and the receiving basin. Thus moving water from Bull Run to the West Slope would be exempt.Transferring water from the Clackamas River to elsewhere in the Metropolitan area would be regarded as moving water from one sub-basin of the Willamette River to another sub-basin and approval would not be required.**Water Rights on the Clackamas**Certain provisions of the water laws apply only to municipal users. The differences are generally as follows:1. Water use permits continue indefinitely.
2. Restrictions on the place of water use are less stringent.
3. Municipal uses are exempt for many provisions related to abandonment and forfeiture for non-use.
4. A municipality may partially perfect water use under a water use permit That is, the full amount of the water right does not have to be used at some point during a five-year period.

River Gauge No. 14211000, above Johnson Creek is the nearest measurement gauge upstream of the major municipal intakes on the Clackamas River. Between it and the mouth of the River, most of the water rights are municipal. Non-municipal rights in that area total 6.39 cfs, 4.39 cfs classified for irrigation and 2.00 cfs classified for industrial.Lake Oswego, South Fork Water Board (Oregon City& West Linn), Oregon City, Gladstone, Clackamas Water District (CRW), and Oak Lodge Water District (OLWD), now a part of the North Clackamas County Water Commission (NCCWC), hold water use permits or water certificates on the Clackamas River.Those with the rights may act as wholesalers to other water districts or authorities. They may also join with other rights holders or water districts not having their own rights or insufficient access to water to form an authority providing water to its constituents. For example, South Fork Water Board, now owned equally by Oregon City and West Linn, provides water to Oregon City and West Linn, using water rights mostly held by Oregon City. Water rights may be totally unused as in the case of Gladstone, which no longer provides water, but gets its water from CRW.NCCWC was formed by intergovernmental agreement between Oak Lodge Water District and Sunrise Water Authority and wholesales water to both groups. Sunrise Water Authority has other water resources. CRW is Sunrise Water Authority’s sole source in winter, providing a fixed amount. In summer limited volume is supplemented by water from NCCWC and from wells. Oak Lodge Water District receives almost all its water from NCCWC. (Oak Lodge serves the Jennings Lodge and Oak Grove areas, about six to seven square miles. Sunrise Water Authority serves about 12 square miles in the Mt. Scott, Happy Valley and Damascus areas.)

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| **Clackamas River Water Rights Put to Municipal Beneficial Use** |
| Purveyor | Total Water Rights (cfs) | Installed Treatment Capacity (aft) | Remaining Rights Senior to Instream Right (cfs) | Remaining Rights Junior to Instream Rights (cfs) |
| CRW | 46.5 | 46.4 cfs (30 mgd) | 0 | 0.1 |
| SFWB | 66 | 30.9 cfs (20 mgd) | 35.1 | N/A |
| Lake Oswego | 34 | 24.7 cfs (16 mgd) | 0.3 | 9 |
| NCCWC (OLWD&SWA) | 62 | 15.5 cfs (10 mgd) | N/A | 46.5 |
| Gladstone | 13.73 | N/A | 4 | 9.73 |
| SFWB (not useable)2 | 50 | N/A | 50 | N/A |
| **Total** | **272.23** | **117.5 cfs (76 mgd)** | **39.4(+50)** | **65.33** |

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**N/A** - Not applicable; Gladstone does not have a water treatment plant**2 SFWB** - water rights points of diversion located on South Fork of Clackamas River and Memaloose Creek upstream of existing diversion. It is uncertain how much of these water rights will be available for use at the treatment plants on the Clackamas River.(Regional Water Providers Consortium: Water Rights Review Update/Draft, page 13)The chart shows that there is about 39.5 cfs. (25.5 mgd) of remaining (unused) municipal water rights senior to the 1968 instream rights. This total excludes other beneficial uses senior to the municipal rights, possible future instream rights imposed by future ESA rulings, or the SFWB’s Memaloose Creek rights upstream. However, Sunrise Water Authority and CRW have water rights applications totaling about 159 cfs.There are ongoing efforts by the OWRD to encourage municipal rights holders to relinquish unused rights. Rights holders are not enthusiastic and talks drag on.The SFWB Memaloose Creek rights totaling 50 cfs are not currently available, because using them may interfere with down stream users, namely PGE or instream flows. There are questions as to whether water authorities can transfer undeveloped water use permits. In the case of SFWB this means that it is unable to transfer its use rights downstream to its current diversion pointbelow PGE's dams. Thus the total available for SFWB may be closer to 66 cfs than the official 116 cfs.Estacada also has water diversion rights (at rm 24.9) of 6.18 mgd of which it uses about 4 mgd. Other than Estacada, all the municipal water diversion points fall within the first eight river miles. The total water rights for the Metro area, excluding Estacada, total 272.23 cfs.**Actual Volume of Water Diverted**It is necessary to remember that diversion does not necessarily mean consumed or completely lost. Water may be returned to the river-after use, for example after passing through electric generators, excess irrigation water, treated wastewater, surface or ground water run-off. However, for the urban areas on the Clackamas River, with the exception of Estacada, wastewater is normally returned to the Willamette River outside the basin. Treated water pumped to the west side of the Willamette also leaves the sub-basin permanently as does water sold for use northward out of the sub-basin to Gresham and Rockwood. CRW is aggressively seeking to expand its sales in that direction. (One of the hottest controversies among Clackamas River Stakeholders. More in Part III)For the record, during a 21 year period from 1963 - 1983, the lowest Clackamas River flow at river mile 4.8 (one mile upstream from the mouth of Johnson Creek) was 217.1 MGD or 335 cfs recorded in September 1969. The total municipal water rights for the Metropolitan area served by the Clackamas River are 272.23 cfs of which 50 cfs is not currently useable.Compared either to use or to the total volume of water in the lower miles of the Clackamas, municipal water rights are over-allocated. If all rights were to be exercised to the fullest, the lower reaches of the Clackamas would have extremely low water for part of the year.Although Clackamas River water providers have several water rights that are unused or not fully utilized, it is presently unlikely that the OWRD will cancel them. However the possibility exists according to the State Attorney General. Rights holders are not enthusiastic and talks drag on. Bar Graph Comparison: September Flows, Rights and ApplicationsCompare September's natural and lowest flows with the totals for general water rights and the applications for new water rights.E. Irrigation 55.36 cfsD. Remaining junior municipal rights 65.33C. Instream rights 400.0 in Aug/Sept.B. Remaining senior municipal water rights 39.4A. Senior rights: installed municipal treatment capacity 117.5cfs.Bar Graph: Clackamas River Flows**Environmental Concerns and Their Potential Impact on Municipal Water**Municipal water providers, as the largest senior rights holders, and major water consumers benefit from environmental concerns that keep water quality high and water volume sufficient and reasonably predictable. At the same time, there are negative aspects for municipal providers. First there are costs that are ultimately passed on to the consumer, e.g. fish screens at water intakes or sharing capital costs for water storage facilities. Second, there is the concern about the limits that have been, or may be, placed on the volume of water available at a time when use is increasing. The low-flow months are where the first pinch will be felt. The third area of concern is that the major municipal water intakes are located in the first eight river miles, through which migrating fish must pass to reach the upper areas of the watershed. Low-flow season water volume and higher water temperatures are the problems. PGE hydroelectric plants in the lower river may add to the temperature problems as water redirected after passing through the generators will be slightly warmer than the mainstream.The concept of instream rights is a constraint on water availability for other purposes. The volume allotted to instream flows can vary with the year, the month, the week. Historically there has been river flow in excess of instream rights with the exception of the month of September in some years. Authorized withdrawals more frequently exceed the scenic waterway requirements for August and September. But fortunately, the largest diversion points lie downstream of Carver, the end of the nearest scenic river stretch. The OWRD has instream rights extending from Three Lynx Creek (rm 47.3) to confluence with the Willamette.What the future will be for instream rights is uncertain. As legal and administrative requirements grow to protect instream demands, various authorized users may lose full access to water and the issuance of new water rights may be limited.The impact of the Endangered Species Act (ESA) is even more uncertain. What the requirements of the ESA will be, and the areas to which they might be applied are in the relatively early stages of development. For instance, the National Marine and Fish Service (NFMS) biological opinion flows for the Columbia River proper may potentially apply to tributaries because they are part of the Columbia River Basin. Newly listed endangered species may result in rulings that limit water rights permits in the future. Whether the rules could be applied "retroactively" to existing rights is also uncertain. Lower Columbia River listed species (including the Clackamas River) are chinook salmon, chum salmon and steelhead. Cutthroat trout may soon be listed. Current rules prohibit any take for steelhead and chinook.The Clackamas watershed has many interested parties, both public and private concerned with maintaining the integrity of the ecosystem and its water resources. On the federal level, the Northwest Forest Plan's Record of Decisions can designate watersheds as Tier One or Tier Two Watersheds. Tier One Watersheds contribute directly to the conservation of at risk salmon species, bull trout and resident fish species. They also have a high potential for being restored as part of a restoration program. The Clackamas Basin has five Tier One Watersheds. These are the Upper Clackamas, the Collawash River including its Hot Springs Fork, Fish Creek and Roaring River. Tier Two Watersheds do not contain at-risk fish stock but are considered an important source of high quality water. Eagle Creek is a Tier Two watershed. Once assessments have been done, parts of these areas may be opened for logging (matrix lands).The Oregon Chapter of the American Fisheries Association designates aquatic diversity areas (ADA'S) as critical for the protecting native aquatic fauna. Type One ADA'S are ecosystems in relatively healthy condition that are among the best remaining examples of their kind. Type Two ADA'S are ecosystems containing certain aquatic species in imminent danger of extinction. Three Clackamas sub-watersheds are classified as Type One, the upper Clackamas, and the Collawash River with its Hot Springs Fork.The Northwest Forest Plan aquatic conservation strategy has many of the same objectives as do several other state and private programs. However, only federal agencies currently provide special protection to these areas.The Oregon Division of State Lands in consultation with the Department of Fish and Wildlife has identified about 225 miles of essential salmon habitat in the watershed. Fill and removal activities are subject to stricter regulation in these areas (ORS 141-102000 to 102100).The 1972 federal Clean Water Act requires each state to identify bodies of water that do not meet water-quality standards. These waters are termed "water-quality limited" and the state must include them on a list called the 303 (d) list. The list identifies the problem but not the causes, which may need later investigation. Three areas in the Clackamas watershed are on the OR DEQs 303 (d) list. They am the Clackamas itself form its mouth to the River Mill Dam at rm 23.3, Eagle Creek from its mouth at rm16.7 to well upstream and Fish Creek at rm 41.7. The primary reason is overly high water temperature in the summer.State forest practices that are of particular importance for water quality protection concern activities within 100 feet of streams used for domestic water supply. Riparian management areas (RMAs) from 20 to 70 feet wide are required for streams supplying domestic water. Where fish are present the RMAs are from 50 to 100 feet. Requirements for timber harvest within an RMA are so stringent (Department of Forestry must approve plans) that many owners leave an RMA untouched, forgoing potential profits. Community water system managers must be notified of any chemical application within 50 (on ground) or 100 (aerial) feet of a stream used for domestic water supply. Buffer zones vary from ten to 300 feet depending on the chemical and how it is applied.The Clackamas River Basin Council (CRBC) was formed in 1997 to provide a forum for both the public and private sectors to work together to improve the quality of drinking water and to enhance fish and wildlife habitat throughout the basin. It is a volunteer non-profit organization comprising numerous stakeholder groups. It is funded by grants and in-kind donations from the Oregon Watershed Enhancement Board (OWEB), waterproviders, Clackamas County, the U.S. Forest Service, and interested individuals and stakeholder groups. Committees carry out much of the Council's work. Activities include riparian remediation, culvert and fish barrier studies, reviewing landuse practices and assessment of watershed conditions.The CRBC has undertaken a watershed assessment that will integrate all of the studies concerning the basin from various sources. The study will be the basis for an action plan which residents and land managers can use on a voluntary basis to preserve and improve the health of the basin. One of the first sub-basin assessment programs undertaken, is the Clear Creek sub-basin, south of Springwater Ridge and roughly paralleling the Clackamas for much of its 30 mile length. A detailed property by property picture is being assembled. This tributary system was chosen for assessment because it is the longest tributary and it also most resembles the Clackamas in terms of variety of land use. The Deep and Goose Creek sub-basins are also being assessed. |
| Summary and ConclusionsSome of the preliminary findings of the CRBC watershed assessment program agreewith this study’s conclusions, namely;* Chemicals, stormwater, and urbanization have a big impact on water quality and fish and wildlife habitat.
* High water temperature and turbidity are a concern.
* The Clackamas Basin as a whole is generally in good shape. However, stream and habitat restoration is needed, especially downstream of River Mill Dam (the lower one-third of the basin).

Further study conclusions are:* Quality water depends on the health of the watershed;
* Water is an increasingly scarce resource;
* The question of partly used, very large municipal water rights operating under more flexible rules than other categories of water rights, will generate increasing discussion and controversy;
* The future impact of ESA requirements and other instream needs is uncertain but will undoubtedly place more strain on the water allocation.

The final part of the LWVCC Drinking Water Study will cover water delivery systems for West Clackamas County including groundwater, and the pricing and sale of water.**DISCUSSION QUESTIONS**1. Do the three national and state positions in the addendum B adequately address broader issues that may arise about the Clackamas Basin? Do we need more detailed local positions? If so what?
2. Should excess municipal water rights be retained? voluntarily returned for instream purposes? transferred to other municipalities or agencies?
3. Should municipalities resist state revision of the current indefinite extension of permits without perfecting the right? In general, should they resist the state tightening up the extension process?
4. How do you feel about urban growth in the eastside Sandy/Boring/Damascus are. What kind of growth, if any, do you favor– residential, commercial or industrial?
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