Oregon
Theodore R. Kulongoski, Governor

Department of Land Conservation and Development
635 Capitol Street, Suite 150
Salem, OR 97301-2540
(503) 373-0050
Fax (503) 378-5518
www.lcd.state.or.us

NOTICE OF ADOPTED AMENDMENT

08/04/2014

TO: Subscribers to Notice of Adopted Plan
or Land Use Regulation Amendments

FROM: Plan Amendment Program Specialist

SUBJECT: City of Brookings Plan Amendment
DLCD File Number 004-14

The Department of Land Conservation and Development (DLCD) received the attached notice of adoption. A Copy of the adopted plan amendment is available for review at the DLCD office in Salem and the local government office.

Appeal Procedures*

DLCD ACKNOWLEDGMENT or DEADLINE TO APPEAL: Friday, August 22, 2014

This amendment was submitted to DLCD for review prior to adoption pursuant to ORS 197.830(2)(b) only persons who participated in the local government proceedings leading to adoption of the amendment are eligible to appeal this decision to the Land Use Board of Appeals (LUBA).

If you wish to appeal, you must file a notice of intent to appeal with the Land Use Board of Appeals (LUBA) no later than 21 days from the date the decision was mailed to you by the local government. If you have questions, check with the local government to determine the appeal deadline. Copies of the notice of intent to appeal must be served upon the local government and others who received written notice of the final decision from the local government. The notice of intent to appeal must be served and filed in the form and manner prescribed by LUBA, (OAR Chapter 661, Division 10). Please call LUBA at 503-373-1265, if you have questions about appeal procedures.

*NOTE: The Acknowledgment or Appeal Deadline is based upon the date the decision was mailed by local government. A decision may have been mailed to you on a different date than it was mailed to DLCD. As a result, your appeal deadline may be earlier than the above date specified. NO LUBA Notification to the jurisdiction of an appeal by the deadline, this Plan Amendment is acknowledged.

Cc: Donna Colby-Hanks, City of Brookings
Gordon Howard, DLCD Urban Planning Specialist
Dave Perry, DLCD Regional Representative

<paa> YA

New DB# {22262}

DLCD FORM 2

NOTICE OF ADOPTED CHANGE TO A COMPREHENSIVE PLAN OR LAND USE REGULATION

FOR DLCD USE 004-14 (20362) [17954]
File No.:
Received: 8/1/2014

Local governments are required to send notice of an adopted change to a comprehensive plan or land use regulation **no more than 20 days after the adoption**. (*See* OAR 660-018-0040). The rules require that the notice include a completed copy of this form. **This notice form is not for submittal of a completed periodic review task or a plan amendment reviewed in the manner of periodic review.** Use Form 4 for an adopted urban growth boundary including over 50 acres by a city with a population greater than 2,500 within the UGB or an urban growth boundary amendment over 100 acres adopted by a metropolitan service district. Use Form 5 for an adopted urban reserve designation, or amendment to add over 50 acres, by a city with a population greater than 2,500 within the UGB. Use Form 6 with submittal of an adopted periodic review task.

Jurisdiction: City of Brookings

Local file no.: **CP-1-14**

Date of adoption: 07/28/2014 Date sent: 8/1/2014

Was Notice of a Proposed Change (Form 1) submitted to DLCD?
Yes: Date (use the date of last revision if a revised Form 1was submitted): 05/13/2014
No

Is the adopted change different from what was described in the Notice of Proposed Change? Yes No
If yes, describe how the adoption differs from the proposal:

No

Local contact (name and title): Donna Colby-Hanks, Planning Manager

Phone: (541) 469-1137 E-mail: dcolbyhanks@brookings.or.us

Street address: 898 Elk Drive City: Brookings Zip: 97415-

PLEASE COMPLETE ALL OF THE FOLLOWING SECTIONS THAT APPLY

For a change to comprehensive plan text:
Identify the sections of the plan that were added or amended and which statewide planning goals those sections implement, if any:

Text revisions to the Public Facilities Plan and Goal 11 Public Facilities and Services.

For a change to a comprehensive plan map:
Identify the former and new map designations and the area affected:

Change from to acres. A goal exception was required for this change.

Change from to acres. A goal exception was required for this change.

Change from to acres. A goal exception was required for this change.

Change from to acres. A goal exception was required for this change.

Location of affected property (T, R, Sec., TL and address):

The subject property is entirely within an urban growth boundary

The subject property is partially within an urban growth boundary

If the comprehensive plan map change is a UGB amendment including less than 50 acres and/or by a city with a population less than 2,500 in the urban area, indicate the number of acres of the former rural plan designation, by type, included in the boundary.

Exclusive Farm Use – Acres:	Non-resource – Acres:
Forest – Acres:	Marginal Lands – Acres:
Rural Residential – Acres:	Natural Resource/Coastal/Open Space – Acres:
Rural Commercial or Industrial – Acres:	Other: – Acres:

If the comprehensive plan map change is an urban reserve amendment including less than 50 acres, or establishment or amendment of an urban reserve by a city with a population less than 2,500 in the urban area, indicate the number of acres, by plan designation, included in the boundary.

Exclusive Farm Use – Acres:	Non-resource – Acres:
Forest – Acres:	Marginal Lands – Acres:
Rural Residential – Acres:	Natural Resource/Coastal/Open Space – Acres:
Rural Commercial or Industrial – Acres:	Other: – Acres:

For a change to the text of an ordinance or code:
Identify the sections of the ordinance or code that were added or amended by title and number:

For a change to a zoning map:
Identify the former and new base zone designations and the area affected:

Change from	to	Acres:
Change from	to	Acres:
Change from	to	Acres:
Change from	to	Acres:

Identify additions to or removal from an overlay zone designation and the area affected:

Overlay zone designation:	Acres added:	Acres removed:

Location of affected property (T, R, Sec., TL and address):

List affected state or federal agencies, local governments and special districts: DLCD

Identify supplemental information that is included because it may be useful to inform DLCD or members of the public of the effect of the actual change that has been submitted with this Notice of Adopted Change, if any. If the submittal, including supplementary materials, exceeds 100 pages, include a summary of the amendment briefly describing its purpose and requirements.

IN AND FOR THE CITY OF BROOKINGS
STATE OF OREGON

ORDINANCE NO. 14-O-734

IN THE MATTER OF ORDINANCE 14-O-734, AN ORDINANCE ADOPTING REVISIONS TO THE CITY OF BROOKINGS COMPREHENSIVE PLAN, GOAL 11, PUBLIC FACILITIES AND SERVICES AND ADOPTING A NEW PUBLIC FACILITIES PLAN. THIS EFFECTIVELY REPEALS THE PREVIOUS PUBLIC FACILITIES PLAN CREATED BY ORDINANCE 11-O-678 AND ALL SUBSEQUENT REVISIONS.

Sections:

Section 1. Findings
Section 2. Amendments
Section 3. Severance Clause
Section 4. Effective Date

The City Council for the City of Brookings ordains as follows:

Section 1: Findings

1. Goals 11 of the Brookings Comprehensive Plan is in need of amending to reflect the updated Water Master Plan. Amended Goal 11 is attached hereto and incorporated by reference.

2. The Public Facilities Plan is also in need of updating to reflect the updated Water Master Plan. The amended plan is attached hereto and incorporated by reference.

3. Staff sent the 35 day notice to DLCD as required under ORS 197.610 for post acknowledgment plan amendments for the proposed changes to the Comprehensive Plan and Public Facilities Plan.

4. Staff conducted a public hearing before the Brookings City Planning Commission on July 1, 2014. The Commission recommended approval to the City Council.

5. Following public notice, as required by law, the Brookings City Council conducted a hearing on the proposed amendments on Monday, July 28, 2014 at 7:00 P.M. at the Brookings City Hall. Approval was given to the Comprehensive Plan and to the Public Facilities Plan that are attached hereto and incorporated by reference.

Section 2 Amendments

The City of Brookings Comprehensive Plan (Ordinance No. 11-O-678, previously the most recent revision) is amended as shown by the attached changes in the Comprehensive Plan, and by adopting the attached Public Facilities Plan.

Section 3: Severance Clause

If any section, subsection, sentence, clauses or phrases of this ordinance is, for any reason, held to be unconstitutional or otherwise invalid, such decision shall not affect the validity of the remaining portions of this ordinance.

Section 4: Effective Date:

This ordinance shall take effect 30 days following its passage.

First reading: July 28, 2014
Second reading: July 28, 2014
Passage: July 28, 2014
Effective date: August 27, 2014

Signed by me in authentication of its passage this 30th day of July, 2014.

Ron Hedenskog
Mayor Ron Hedenskog

ATTEST:

City Recorder, Joyce Heffington

CITY OF BROOKINGS

COUNCIL AGENDA REPORT

Meeting Date: July 28, 2014

Originating Dept: PW/DS

Public Works/Development Services Director

City Manager Approval

Subject: A hearing on File CP-1-14 for consideration of 2014 Water Master Plan Update and revisions to the Public Facilities Plan and Goal 11 of the Comprehensive Plan.

Recommended Motion: Approve the 2014 Water Master Plan Update and revisions to the Public Facilities Plan and Goal 11 of the Comprehensive Plan.

Financial Impact: The document estimates $6.1 million dollars needed for piping improvements, additional storage requirements, pump station and treatment plant upgrades.

Background/Discussion: The previous Water Master Plan update occurred in 2008. Master plans updates are recommended every five years for these reasons;

1) System development charges (SDC) are calculated based on the CIP projects identified in the master plan.
2) Future of SDC funds requires the project to be listed in the master plan.
3) Grant applications almost always require the project to be included in a master plan.
4) Priorities changes and new projects emerge.
5) Growth projects can differ than what was projected.
6) City Council direct staff to update all master plans in the City's strategic plan.
7) Master plans are necessary for future rate study and SDC updates.
8) Budgets are developed from master plans.

The new master plan addresses a 20 year planning period to year 2033 assuming an annual growth rate of 2%. After evaluating the past to present master plans, areas of interest include;

Water consumption

- Water use per capita has decreased 10% since the last master plan update in 2007 and 40% since the 2000 master plan update, or 77.8 gallons per capita per day (gpcd), 96.9 gpd, and 133 gpcd respectively.

Unaccounted for water use

- Has dropped to 10% which is considered acceptable in the industry. In 2007, the water loss was 13%, and in 2000 the water loss was 20%.

Water supply

- Staff does not concur with the recommendations for the water treatment plant. Attachment b) is a detailed explanation on the reasons staff does not support budgeting for water treatment plant expansion or removal.

Water storage

- The master plan recommends increased water storage in the Old County Road area (minimum of 250,000 gallons) and an estimated cost of $860,000.

Distribution

- The most costly recommendation in this master plan is $6.1 million dollars recommended for piping infrastructure improvements.

Booster Pumps

- The report recommends Mountain drive pump station replacement and a new pump station of the proposed Old County Road tank at a total of $863,000. Staff will explore if the decommissioned Vista Ridge Pump Station as a part of the Airport infrastructure project can be reused for the Mountain Drive pump station, thereby eliminating a majority of the replacement costs.

Staffing

The report recommends increased staffing for maintenance and preventative maintenance such as valve exercising.

The Water Master Plan and Memorandum from staff Attachment a was unanimously approved by the Planning Commission on July 1, 2014.

Policy Considerations: Projects identified in the master plan are considered priority projects for capital improvement project budgeting for the next 5 to 10 years.

Attachment(s):

a. Memorandum from staff dated 7/2/14
b. Draft Public Facilities Plan
c. Draft Goal 11, Public Facilities and Services

City of Brookings

PUBLIC WORKS/DEVELOPMENT SERVICES DEPARTMENT

898 Elk Drive, Brookings, OR 97415

(541) 469-1138, Fax (541) 469-3650, TTY (800) 735-1232

lpryce@brookings.or.us

Memorandum

Date: July 2, 2014

To: City Council

From: Public Works/Development Services Director LP

CC: City Manager

Subject: Water Master Plan Additional Comments from staff

The City recently retained the services of Bill Pavlovich with Pace Engineering to update the water system master plan. The purpose of a master plan update is to evaluate existing infrastructure compared to future development and population growth trends for up to 20 years. The master plan will identify deficiencies and infrastructure needs and serves as a tool for grants, system development charge updates (SDC) and capital improvement project (CIP) budgeting. The last update to the water master plan occurred in 2008.

The intent of this memorandum is to document staff's opinion which differs from a recommendation made in the recent water master plan update. The master plan proposes an upgrade or elimination of the water treatment plant. Staff disagrees with elimination of the treatment plant, and sees no urgency in upgrading the treatment plant. Staff argues that deficiencies are not with the treatment plant capacity, but with the hydraulics of the associated piping/pump systems. The water master plan considers the water treatment plant a bottleneck to adequate water supply for future demand (3.1 MGD) and recommends upgrading, eliminating or building a new treatment plant to meet future capacities. All three options have a significant financial impact ranging from $3.8 to $14 million dollars.

The existing treatment plant is a 2.6 million gallon per day (MGD) capacity plant located on the North Bank Chetco River in the vicinity of the Datone rock quarry. The distribution pumping at the WTP is designed for 2.6 MGD but currently runs a total of 2 of the 3 pumps at 2.1 MGD peak flow. The water supply is collected underground via the Rainey Collector on the gravel bank of the Chetco River, injected with chlorine, and conveyed to the water treatment plant. The treatment plant consists of a clear well (or underground holding tank for water), 3 distribution pumps that pump the water into the City's distribution system, and 2 sedimentation tanks and 2 filter bays which is the treatment process for the water system. After several years of providing water samples to Department of Health Services (DHS), the pre treated disinfected water samples collected from the Rainey Collector's intake have passed DHS standards. The DHS permit was downgraded such that the permit no longer requires the use of the treatment plant in order to comply with the permit. The master plan suggests removing the water treatment plant (WTP) or upsizing it to meet future water

CITY OF BROOKINGS PLANNING COMMISSION
STAFF REPORT

SUBJECT: Water Master Plan Update
FILE NO: CP-1-14
HEARING DATE: July 1, 2014

REPORT DATE: July 1, 2014
ITEM NO: 5.2

GENERAL INFORMATION

APPLICANT:	City Initiated.
REPRESENTATIVE:	City Staff.
REQUEST:	Approval of an update to the City's Water Master Plan as well as text revisions to the Public Facilities Plan (PFP) and Goal 11 Public Facilities and Services to reflect the information from the update. City initiated.
PUBLIC NOTICE:	Published in local newspaper.

BACKGROUND INFORMATION

The previous Water Master Plan update occurred in 2008. Master plans updates are recommended every five years for these reasons;

1) System development charges (SDC) are calculated based on the CIP projects identified in the master plan.
2) Future of SDC funds requires the project to be listed in the master plan.
3) Grant applications almost always require the project to be included in a master plan.
4) Priorities changes and new projects emerge.
5) Growth projects can differ than what was projected.
6) City Council direct staff to update all master plans in the City's strategic plan.
7) Master plans are necessary for future rate study and SDC updates.
8) Budgets are developed from master plans.

The Executive Summary as seen in Attachment (a) provides an overview of the findings in the water master plan. The new master plan addresses a 20 year planning period to year 2033 assuming an annual growth rate of 2%. After evaluating the past to present master plans, areas of interest include;

Demographics

- The population of persons over 65 has dropped by 47.3 percent was found to be in error and will be revised before adoption.

Water consumption

- Water use per capita has decreased 10% since the last master plan update in 2007 and 40% since the 2000 master plan update, or 77.8 gallons per capita per day (gpcd), 96.9 gpd, and 133 gpcd respectively.

Unaccounted for water use

- Has dropped to 10% which is considered acceptable in the industry. In 2007, the water loss was 13%, and in 2000 the water loss was 20%.

Water supply

- Staff does not concur with the recommendations for the water treatment plant. Attachment b) is a detailed explanation on the reasons staff does not support budgeting for water treatment plant expansion or removal.

Water storage

- The master plan recommends increased water storage in the Old County Road area (minimum of 250,000 gallons) and an estimated cost of $860,000.

Distribution

- The most costly recommendation in this master plan is $6.1 million dollars recommended for piping infrastructure improvements.

Booster Pumps

- The report recommends Mountain drive pump station replacement and a new pump station of the proposed Old County Road tank at a total of $863,000. Staff will explore if the decommissioned Vista Ridge Pump Station as a part of the Airport infrastructure project can be reused for the Mountain Drive pump station, thereby eliminating a majority of the replacement costs.

Staffing

The report recommends increased staffing for maintenance and preventative maintenance such as valve exercising.

This document identifies future capital improvement projects (CIP) which will direct staff on priorities for future budgets. The document estimates $6.1 million dollars needed for piping improvements, additional storage requirements, pump station and treatment plant upgrades.

City Council reviewed this document in a workshop March 6, 2014 and had no further comments or corrections.

RECOMMENDATION Approval of an update to the City's Water Master Plan as well as text revisions to the Public Facilities Plan (PFP) and Goal 11 Public Facilities and Services to reflect the information from the update.

ATTACHMENTS

a) Executive Summary
b) Memo from Public Works Director
c) Public Facilities Plan Update

BACKGROUND

Significant changes have occurred since adoption of the 2007 Water Master Plan Update. Impacts of the recession on local economics and growth were marked and perceptions of future growth, while still optimistic, are more modest than was previously the case. Even though the City has grown, water production requirements are actually lower than in 2007. Water rights issues associated with the City's intake have been resolved and require modifying the previous plan for water supply expansion. Some projects that were in design or ready to bid in 2007 were not constructed; others were constructed but with significant modifications. Currently the City is in design phase of developing a project to extend water and sewer service to the Brookings Airport that will entail construction of a reservoir on the hillside above the airport. The project also entails the removal of several pump stations and a reservoir and will result in significant changes to the affected service areas and service area boundaries.

PLANNING PERIOD

This Plan uses a 20 year planning period (through the year 2033).

POPULATION AND DEMOGRAPHIC CHARACTERISTICS

Population increased by 16.3 percent between the 2000 and 2010 censuses. Median age of the population increased to an average of 46.9 years. Most notably the population of persons over 65 years old dropped by 47.3 percent. Housing units increased by 21.8 percent – higher than the percent increase in population. As a result, average household size dropped from 2.30 to 2.26 persons per household.

Population projections are based on a 2 percent average annual growth rate (AAGR). The growth rate is consistent with the City's Comprehensive Plan and was coordinated with the City Planner prior to utilization in this master plan. Population projections are shown below:

City of Brookings Population Projections (2% AAGR)

Year	In-City Population (Persons)	Outside City Population (Persons)	Water System Population (Persons)	Percent Increase Over Year 2013
2013	6,561	906	7,467	
2033	9,749	1,346	11,096	48.6

WATER USAGE AND DEMANDS

Metered water usage for the period October 2011 to September 2012 is summarized by customer category in Table 5.1. Residential usage constitutes 73 percent of total metered use – approximately the same as noted in the 2007 Water Master Plan. Residential usage in the City averages 77.8 gpcd (gallons per capita per day) – down considerably from the 96.9 gpcd noted in the 2007 Plan. The reason for this is not known with certainty; however, it is likely that new and retrofit construction with water efficient fixtures may be a factor. In addition, the City had a water conservation program until a few years ago that may have also contributed. Average per capita residential use has dropped over 40 percent from the 133 gpcd noted in the 2000 Water Master Plan.

Recent water production is summarized in Table 5.3. For the four water years reviewed, the overall trend is for lower annual water production even though the City has been growing at a modest rate. This reflects a continuation of the trend noted in the 2007 Water Master Plan.

Recent Water Production (October 2008 - September 2012)

	Oct 08 - Sept 09 (mgd)	Oct 09 - Sept 10 (mgd)	Oct 10 - Sept 11 (mgd)	Oct 11 - Sept 12 (mgd)
Annual (gal)	358,595,000	339,974,000	324,936,000	324,131,000
Avg Day (mgd)	0.982	0.931	0.890	0.888
Max Month	1.408	1.603	1.234	1.152

mgd = million gallons per day

Current unaccounted-for water is approximately 10%. This reflects an improvement over the 13.7% reported in the 2007 Master Plan and over the 20% reported in the 2000 Master Plan. Improvements are likely attributed to more detailed water auditing, leak detection and correction, and recent water main and water meter improvement projects. Additional reductions may be possible for the City; however, even maintenance of a 10% level of unaccounted-for water requires a sustained level of effort.

Projected water production demands for the Brookings water system are shown below.

Projected Water Production Demands

Year	2013	2018	2023	2028	2033	2063
Population	7,467	8,244	9,102	10,050	11,096	20,098
EDUs	5,090	5,620	6,205	6,851	7,564	13,700
Average Day Demand (mgd)	0.9	1.0	1.1	1.2	1.3	2.4
Maximum Day Demand (mgd)	2.1	2.3	2.6	2.8	3.1	5.7

EDU = Equivalent Dwelling Units

WATER SOURCE AND WATER RIGHTS

The Ranney Collector source, near the Chetco River, provides an ample supply of high quality water and is currently the City's only developed source. This source has adequate capacity for the 20-year planning horizon. Year 2033 MDD (maximum day demand) is 3.1 mgd; the water rights for this source total 3.6 mgd.

Note: *While the source, intake structure, and water rights are adequate for the planning period, installed water supply capacity, associated with the intake pumps and water treatment plant, is not.*

WATER SUPPLY

In a very general sense, the water supply system is currently at capacity. The water supply system, including the intake pumps, water treatment plant and clearwell pumps, have been used at full capacity for meeting peak day system demands (MDD). The City has operated under these conditions for a number of years as increased water usage efficiencies have kept pace with system growth. This is a tenuous balance and one not likely to be sustained for much longer. It also leaves the City vulnerable to potential supply shortages since there is no reserve capacity upon which to depend. Supply system improvements are likely to be costly to implement, so

the process of financing, in addition to design and construction, can mean that several years may elapse before the needed capacity increase (to address the shortages) is realized.

The current system MDD of 2.1 mgd is approximately equal to the current installed capacity of the system. Expanding system capacity has ramifications for each component of the supply system: intake, water treatment plant (WTP), and transmission mains. Several alternatives for expanding the supply were developed.

Each alternative includes upgrades at the intake and to the transmission mains. Transmission upgrades are largely the same for each alternative: replacement of old, undersized AC transmission mains with new 16-inch lines. Sizing is generally consistent with long-term full development of the Ranney Collector water right. The proposed 16-inch lines will be consistent with newer sections of the existing transmission main that were constructed with 16-inch pipe.

The existing WTP is 37 years old, has been maintained well beyond its design life of 20+ years, and is currently at capacity. Based on the reviewed turbidity data and the State's classification of the source water as groundwater, it appears the facility is not needed for regulatory compliance. Currently it is not used for filtration purposes during the "summer", but is utilized and needed to pump water into the City via the clearwell and clearwell pumps. The existing electrical system has been modified many times and there is no master electrical documentation that coherently describes what is in place. Abandoned parts of the system have not been removed. Much of the control system is old and obsolete and, at a minimum, should be updated to a PLC-based system. A detailed evaluation of the WTP was beyond the scope of this plan; but based on its age, it is expected that mechanical and other deficiencies will be found that should be addressed in any comprehensive upgrade. It is also expected, again based on its age, that some deficiencies will likely be missed because the defects are internal and not yet visible.

Alternative #1: New WTP. This alternative maintains the City's treatment capabilities. Initial installed capacity should be lower, since the year 2033 MDD is 3.1 mgd; however, the building and overall design should be consistent with a future treatment capacity expansion to 3.6 mgd (the full Ranney Collector water right). Membrane microfiltration is recommended for the treatment process, consistent with previous Master Plan recommendations and discussions with the City, and should work well with the high quality raw water.

Benefits of this alternative are the extra measure of safety and somewhat higher level of water quality provided. Negatives include the high capital cost for construction (compared to Alternative #2) as well as high operations, maintenance, and replacement costs (relative to the other alternatives).

Alternative #2: Eliminate WTP. This alternative eliminates the WTP based on the lack of regulatory need for it. Elimination simplifies the overall supply system since the intake pumps can, when replaced, pump directly to the City's distribution system. New disinfection and corrosion control systems would be needed near the intake site as well as a comprehensive upgrade of the intake electrical system, and the provision of new pumps with VFDs (variable frequency drives).

Benefits of this alternative are simplicity and significantly lower costs than Alternative #1 and Alternative #3. Negatives are primarily associated with giving up treatment capabilities that have been historically perceived by the City as providing an extra measure of safety. There is also a risk, probably very low, that the regulatory

turbidity limit could be exceeded. This would trigger a regulatory review and possible requirement to construct a treatment plant. Harbor has a Ranney Collector and does not provide filtration; and the City of Brookings also does not provide filtration for a good part of the year.

Note: *Review comments on the draft Master Plan received March 24, 2014 indicate that the bench turbidimeter used to measure turbidity in the raw water was not measuring accurately. A new turbidimeter has been ordered. The potential impact of new turbidity data on the viability of Alternative #2 is unclear at this time.*

Alternative #3: Upgrade WTP. This alternative entails upgrades to the intake (pumps, electrical, disinfection) and WTP (pumps, electrical, and miscellaneous). Filtration capacity would not be increased since the filters are typically used in winter when demand is lower. The filters may be operated up to the 2.6 mgd rated capacity, but actual maximum utilization will depend on the intake pumps selected and the available flow adjustment provided by the variable frequency drives (VFDs). If demand exceeds the maximum filtration rate, the City would need to decide whether to go with no filtration or with filtration plus changes in reservoir storage. The latter option is not recommended as a general operational strategy, but only as a fallback, emergency option for short-term application. The hydraulic capacity of the WTP (for flows bypassing the filters) will be increased. Pumps at the intake and clearwell would be replaced with new pumps fitted with VFDs. The VFDs would allow the filtration process to be utilized, but allow higher rates of pumping (when the filters are bypassed) in order to meet design MDD.

Benefits of this alternative are lower cost than alternative #1 and the retention of some treatment capabilities. Additional benefits include: the potential for cutting back on use of the filters gradually until the City is more comfortable with the idea of not having filtration capabilities, and lower costs than construction of a new WTP. Negatives are similar to those described for Alternative #1. Additional negatives include: substantial investment in a facility and equipment that has already greatly exceeded its design life, and the potential for significant and unforeseen problems to arise during the next 20 years. This is a compromise approach that may only defer the treatment/supply issue rather than fully satisfy the City's needs over the next 20 years.

Supply Recommendations. From the standpoint of cost and mechanical reliability, Alternative #2 is the clear choice; however, the selection also entails the assumption of an unquantifiable, but probably very low, risk on the part of the City for elimination of filtration capabilities. The decision to go without a treatment plant is largely political in nature – but Harbor does provide a successful, local example of this approach.

A basic comparison is provided in the following table.

Water Supply Comparison

Order-of-Magnitude Cost Comparison

Item/Description	Water Supply Alternatives Order-of-Magnitude Cost Comparison		
	Alt #1: New WTP	Alt #2: Eliminate WTP	Alt #3: Upgrade WTP
Intake			
New Chlorination Facilities	-	$150,000	$150,000
Electrical/Telemetry Upgrade	$200,000	$200,000	$200,000
Pump Upgrade	$150,000	$180,000	$150,000
Flowmeter	-	$50,000	
Misc. Improvements (Allowance)	$50,000	$50,000	$50,000
Intake Subtotal	**$400,000**	**$630,000**	**$550,000**
Water Treatment Plant (WTP)			
New Membrane MF Plant	$7,000,000	-	-
Upgrade Electrical	-	-	$300,000
Upgrade Pumps	-	-	$150,000
Upgrade Disinfection	-	-	$100,000
Misc. Improvements (Allowance)	-	$20,000	$500,000
WTP Subtotal	**$7,000,000**	**$20,000**	**$1,050,000**
Transmission			
Project T1 (4,900 LF of 16")	$800,000	$800,000	$800,000
Project T2 (7,000 LF of 16")	$1,100,000	$1,100,000	$1,100,000
16" Connection to/from WTP	$160,000		$160,000
Transmission Subtotal	**$2,060,000**	**$1,900,000**	**$2,060,000**
Construction Subtotal	**$9,460,000**	**$2,550,000**	**$3,660,000**
Contingencies	$1,892,000	$510,000	$692,000
Engineering and Construction Observation	$2,365,000	$637,500	$915,000
Legal and Administration	$473,000	$127,500	$173,000
Project Total	**$14,190,000**	**$3,825,000**	**$5,490,000**

b. Qualitative Comparison

Item/Description	Water Supply Alternatives Qualitative Comparison		
	Alt #1: New WTP	Alt #2: Eliminate WTP	Alt #3: Upgrade WTP
WTP Filtration Capacity	3.1 mgd	None	up to 2.6 mgd
Hydraulic Capacity	3.1 mgd	3.1 mgd	3.1 mgd
Meets OHA Requirements	Yes	Yes	Yes
Meets Environmental Requirements	Yes	Yes	Yes
Estimated Operational Reliability	High	High	Moderate
Relative Operations, Maintenance, Replacement Costs (OM&R)	High	Low	Moderate

The magnitude of the project is such as to require funding assistance through one or more of the State or Federal Financing programs. These typically require a preliminary engineering report and environmental report relevant to the project as part of the overall funding application and approval process.

A preliminary engineering report (PER) will be needed to refine the project scope, elements, design, and costs including specific operations, maintenance, and replacement costs. An opinion of probable cost for preparing the PER is $50,000. The environmental report (ER) will add a minimum of $10,000 to the cost.

RESERVOIR STORAGE

For the water system as a whole, the recommended storage capacity is three times the average day demand (3xADD) plus fire flow (FF). Recommended FF is 3,500 gpm for 3 hours (0.63 MG reserve). The table below projects storage capacity for the City as a whole. With the addition of the Airport Reservoir, the City will meet the projected year 2023 storage capacity needs.

Projected City Reservoir Capacity Needs

	Average Day Demand (ADD) (mgd)	3x ADD (mgd)	Reservoir Volume Needed at 3xADD + FF (MG)	Existing Reservoir Volume (MG)	Additional Volume Needed (MG)
City Total 2013	0.9	2.7	3.33	3.43	-0.10
City Total 2023	1.1	3.3	3.93	3.43	0.50
City Total 2033	1.3	3.9	4.53	3.43	1.10

Old County service area is the largest higher level service area in the City and highly deficient in storage capacity. A new reservoir is needed to provide the additional storage required. A nominal capacity of 250,000 gallons is recommended. Sites for the proposed reservoir are limited. Potential sites have been discussed with City staff. It is recommended that these sites be further researched and the most suitable site or easement be acquired. The opinion of probable cost for the reservoir is $860,000.

Operation of the Seacrest Reservoir has been problematic. An altitude valve installed at the 1.5 MG Reservoir would allow better overall utilization of Seacrest Reservoir by effectively taking the 1.5 MG Reservoir off-line at times to allow for filling and better cycling of water through Seacrest. An opinion of probable cost for the construction of an altitude valve, vault and connections is $87,000. The project will be most effective once the recommended supply improvements have been implemented.

More efficient cycling of water through Seacrest could alleviate some of the water quality concerns in the northwest area, especially if paired with a recommended distribution improvement that reduces the length of the deadend line to Lone Ranch.

Additional reservoir improvements are included in the CIP.

DISTRIBUTION

An assessment of Brookings' needs was developed primarily through map review, review of previous Master Plan recommendations that have not yet been constructed, and information from staff on problem areas. The focus has been on lines with additional concerns such as main break frequency, need for looping to eliminate dead-ends, and general hydraulic and fire protection needs. The CIP includes approximately 30 recommended distribution improvements; total cost is $6,160,000.

Fire protection concerns and needs were reviewed with Jim Watson of the Brookings Fire Department. Recent City main improvements in the southwest part of the City have alleviated many areas of concern, but one area of the City still stands out as being a serious concern. The area of concern focuses on Moore Street (west of Arnold Lane) where development is large and dense and fire flow is limited through a dead-end 6-inch main. Hub Street and Iris Street, immediately south of Moore, are also underserved through a long looped 4-inch main. The opinion of probable cost for improvements in this area is $462,000.

Unaccounted-for water losses currently total 10% and indicate that the water system does not have excessive losses; nevertheless, periodic leak detection should be conducted to maintain or even reduce the water loss figure. Replacement of leak prone lines should also reduce water losses as well as O&M costs associated with emergency main repairs.

BOOSTER PUMPING

Comprehensive upgrades are needed for Mountain Drive #1, #2, and #3 pump stations. From an electrical and controls standpoint, the facilities have been upgraded several times but not with any kind of consistency or coherent plan. Controls, starters, and other key electrical components should be upgraded according to a coherent plan. To achieve this, all three pump stations should be addressed as part of one project. Consideration should also be given to pump replacement and the provision of redundant pump capacity in Mountain Drive Pump Station #3. Anticipated project cost is $188,000.

The 1.5 MG Reservoir Pump Station is actually two separate pump stations: one pumping to the Old County service area and one pumping to the Pacific View service area. The Old County pumping system needs a capacity upgrade to approximately 300 gpm plus a third pump. A new pump station is needed to provide firm capacity (3 pumps) and the increased capacity for the "Old County" system. The part of the station that serves Pacific View is adequate from a capacity standpoint and does provide firm capacity; however, given the overall age and condition, it would be prudent to include its function in the proposed new 1.5 MG Reservoir Pump Station. Constructing a new pump station will allow the old station to remain in operation with minimal complications and down time during the transition from the old to the new system. An opinion of probable cost for the proposed new 1.5 MG Reservoir Pump Station is $675,000.

CAPITAL IMPROVEMENT PLAN (CIP)

The Plan includes a detailed CIP provided in a spreadsheet format. The CIP includes approximately $10,000,000 in recommended improvements exclusive of the water supply improvements which add approximately $4,000,000 - $14,000,000 depending on which alternative is selected. Costs in the CIP can be easily updated by simply entering the current Engineering News Record Construction Cost Index (ENRCCI) number.

OPERATIONS AND MAINTENANCE (O&M)

Most of the recommended capital improvements will not result in increased O&M costs; however, O&M costs are subject to market changes and inflationary pressures, so annual increases are typically required. Budgets and water rates are typically adjusted to take recent or anticipated changes into account; however, system deficiencies that have not been addressed can increase O&M costs in ways and to an extent not easily foreseen. This may take the form of emergency (overtime) call outs and extra cost, interim measures that may be needed until the problem can be addressed correctly, and un-budgeted emergency projects of potentially significant expense. Over time, such costs can add significantly to the overall utility budget.

From an O&M standpoint, there are additional tasks that the City could and should be doing (such as valve exercising). As the City emerges from the recession, the City should budget for, and hire, one additional FTE for the water utility. Ideally the new hire will be certified for both distribution and treatment so as to provide more operational flexibility in scheduling. Actual need may exceed the one FTE recommended; the City should periodically assess staffing adequacy and add staff as warranted so as not to compromise the level of service provided.

WATER RATES AND RATE IMPACTS OF PROJECT FINANCING

The City of Brookings current water rates are divided into two categories: "inside City limits" ($11.18 base rate plus $2.42 per 100 cubic feet overage), and "outside City limits" ($22.36 base rate plus $4.84 per 100 cubic feet overage). There are no additional distinctions such as user type or category, or meter size. An additional "system replacement fee" (SRF) is billed each month on a flat $2.90 per EDU basis.

With the current rate structure, this yields an average, per inside-City-limits residential account, monthly billing of $29.79. If computed on a per EDU basis (3,264 EDUs, 4,617.7 gallons, 617.3 cubic feet), the result is $26.82 per EDU per month.

Aside from the fairly nominal base rate, the City's rate structure reflects a flat rate per volume basis. This has probably contributed to the lower per capita water usage since customers can readily see conservation efforts in the form of lower water bills. In general, such a rate structure is less reliable in providing stable revenue generation because of the large amount of control available to the individual accounts.

Water rates should be simple, sufficient, and fair (equitable). Brookings' rates are certainly simple to understand and apply, and appear to be sufficient based on a review of current budget documents. "Fairness" is less straightforward - though guidelines exist - and are often based, at least in part, on local perception. A detailed water rate study that includes consideration of alternative rate structures would be needed to evaluate the "fairness" issue in any kind of detail.

The following table includes debt service and rate impacts on a per EDU basis for projects funded through the programs identified in the Plan, plus a computation using a 6.5% interest rate. Programs generally have a maximum per project loan, so computations for loans in excess of this amount are omitted in the table. Very large projects often require funding through multiple sources; rate impacts for multiple funding sources are simply added together.

Note: *The table is for general planning purposes only. Actual interest rates, terms, and availability of funds through any given source may vary and are not locked in until an offer of funding is accepted by the City.*

Debt Service and Rate Impacts (per EDU basis)

	Annual Debt Service	Monthly Per EDU Rate Increase	Annual Debt Service	Monthly Per EDU Rate Increase	Annual Debt Service	Monthly Per EDU Rate Increase	Annual Debt Service	Monthly Per EDU Rate Increase
Interest Rate (%):	**2.50**		**3.65**		**4.56**		**6.5**	
Term (years):	**40**		**25**		**25**		**25**	
Reserve (%):	**10**							
EDUS:		**5090**		**5090**		**5090**		**5090**
Loan Total ($)								
$1,000,000	$43,819.86	$0.72	$61,665.89	$1.01	$67,856.14	$1.11	$81,981.48	$1.34
$2,000,000	$87,639.71	$1.43	$123,331.79	$2.02	$135,712.27	$2.22	$163,962.96	$2.68
$3,000,000	$131,459.57	$2.15	$184,997.68	$3.03	$203,568.41	$3.33	$245,944.44	$4.03
$4,000,000	$175,279.43	$2.87	$246,663.58	$4.04	$271,424.54	$4.44	$327,925.92	$5.37
$5,000,000			$308,329.47	$5.05	$339,280.68	$5.55	$409,907.41	$6.71
$6,000,000			$369,995.37	$6.06	$407,136.81	$6.67	$491,888.89	$8.05
$7,000,000					$474,992.95	$7.78	$573,870.37	$9.40
$8,000,000					$542,849.08	$8.89	$655,851.85	$10.74
$9,000,000					$610,705.22	$10.00	$737,833.33	$12.08
$10,000,000					$678,561.36	$11.11	$819,814.81	$13.42

IMPLEMENTATION

Capital improvements can be implemented over the planning period according to the nature of the projects, the relative prioritization of the project, and other financial and practical considerations that the City may have. Several of the projects, the water supply project in particular, are high priority and should be addressed as soon as practicable. Because of the high costs, funding agency participation will likely be needed. Once the City has determined which projects to include, the City should contact IFA to set up a One- Stop Meeting in Salem to discuss potential project funding. Representatives of potential funding agencies attend the meeting and can assist in developing an optimal funding approach.

City of Brookings

PUBLIC WORKS/DEVELOPMENT SERVICES DEPARTMENT

898 Elk Drive, Brookings, OR 97415

(541) 469-1138, Fax (541) 469-3650, TTY (800) 735-1232

lpryce@brookings.or.us

Memorandum

Date: June 19, 2014

To: City Council

From: Public Works/Development Services Director

CC: City Manager

Subject: Water Master Plan Additional Comments from staff

The City recently retained the services of Bill Pavlovich with Pace Engineering to update the water system master plan. The purpose of a master plan update is to evaluate existing infrastructure compared to future development and population growth trends for up to 20 years. The master plan will identify deficiencies and infrastructure needs and serves as a tool for grants, system development charge updates (SDC) and capital improvement project (CIP) budgeting. The last update to the water master plan occurred in 2008.

The intent of this memorandum is to document staff's opinion which differs from a recommendation made in the recent water master plan update. The master plan proposes an upgrade or elimination of the water treatment plant. Staff disagrees with elimination of the treatment plant, and sees no urgency in upgrading the treatment plant. Staff argues that deficiencies are not with the treatment plant capacity, but with the hydraulics of the associated piping/pump systems. The water master plan considers the water treatment plant a bottleneck to adequate water supply for future demand (3.1 MGD) and recommends upgrading, eliminating or building a new treatment plant to meet future capacities. All three options have a significant financial impact ranging from $3.8 to $14 million dollars.

The existing treatment plant is a 2.6 million gallon per day (MGD) capacity plant located on the North Bank Chetco River in the vicinity of the Freeman rock quarry. The distribution pumping at the WTP is designed for 2.6 MGD but currently runs a total of 2 of the 3 pumps at 2.1 MGD peak flow. The water supply is collected underground via the Rainey Collector on the gravel bank of the Chetco River, injected with chlorine, and conveyed to the water treatment plant. The treatment plant consists of a clear well (or underground holding tank for water), 3 distribution pumps that pump the water into the City's distribution system, and 2 sedimentation tanks and 2 filter bays which is the treatment process for the water system. After several years of providing water samples to Department of Health Services (DHS), the pre treated disinfected water samples collected from the Rainey Collector's intake have passed DHS standards. The DHS permit was downgraded such that the permit no longer requires the use of the treatment plant in order to comply with the permit. The master plan suggests removing the water treatment plant (WTP) or upsizing it to meet future water

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demands. Harbor Water is an example of not having a water treatment plant and only disinfects the water supply.

Staff's position on the WTP is as follows;

1) The investment was already made to install a WTP and removal costs far exceed the cost to maintain what we already have in place.

2) The WTP is only operated during peak winter weather when the river is turbid.

3) The WTP operates at minimal expense.

4) The WTP is an insurance policy in the event there is an issue with the water intake quality.

5) The deficiency in the treatment plant capacity can be overcome with evaluating the hydraulics of the distribution pumps, piping, and Rainey intake capacity.

6) The highest water demand is in the summer when the WTP is not operated therefore it is not the main bottle neck in the distribution system.

7) Regulations continue to increase over time. If at a later date the City had trouble meeting higher water quality regulation, the City could find itself needing the treatment plant again.

8) If the WTP is currently not required, then future demands could be met by mixing the treated water with raw water and providing the customers of Brookings a higher quality of water.

9) The clearwell and distribution pumps are located at the WTP. The distribution pumps and Rainey pumps are required with or without a WTP and incur most of the expense to operate, not the treatment process.

10) Increased storage in the distribution system via the Airport infrastructure project and proposed Old County Rd storage will assist with meeting peak demand flows.

11) Increased water conservation can reduce peak demands in summer months.

Unless given further direction by City Council, staff has no further plans to change it's current WTP operation practice or budget according to the WTP strategies recommended in the master plan. Staff will proceed with evaluating the distribution system hydraulics and report to Council at a later date on what measures will be necessary on the pipe/ pump capacities.

Proposed new text is **bold.**
Text to be deleted is ~~strikethrough.~~

PUBLIC FACILITIES PLAN

CITY OF BROOKINGS WATER SYSTEM

The City of Brookings acquired the water system serving property within the City in 1973 and operates the water system as a City business enterprise. The City has made substantial improvements to the water system over the years.

The water enterprise consists of the following operating systems:

Source of Supply: The locations where the City takes or has the right to take water for municipal purposes, and the system for transmission of the water taken from these locations to the water treatment plant and distribution system.
Treatment: Filtering and chemically treating water from the sources of supply to assure that the water meets safe drinking water standards.
Distribution: A system of pipes that delivers water from the treatment plant to storage reservoirs, fire hydrants and individual properties for domestic and industrial use. Distribution includes operation and maintenance of water usage meters.
Management and Customer Service: Overall management of the water enterprise, engineering, planning, meter reading, billing/collections and customer service (new connections, turn-on/turn off, etc).

WATER SOURCE

Following is the current status of the City's various water right development applications and certificates.

Table 3.1: City of Brookings Water Rights

Source / Type	Permit No.	Certificate No.	Priority Date	Quantity
Chetco River (S) (Ranney)	27610	63682	9/14/1961	4.0 cfs
Chetco River (S) (Ranney)	31293	67358	1/21/1966	1.57 cfs
Chetco River (G) ("Tide Rock")	G5601	64614	8/14/1972	6 cfs
Chetco River (S)	51383		12/12/1990	1.0 cfs (Mar 1 - Jun 30)
Chetco River (R)	R11535		8/13/1993	62.3 Ac-ft
Chetco River (R) (10 Reservoirs)	51595		8/13/1993	62.3 Ac-ft
Ferry Creek (S)	1740	2078	8/22/1913	3.0 cfs
Ferry Creek Reservoir (R)	372	1407	8/9/1916	1.5 MG
Ferry Creek Reservoir (R)	408	2071	8/25/1917	28 Ac-ft
Ferry Creek Reservoir (R)	31224	46661	2/10/1966	167.4 Ac-ft
Ferry Creek Reservoir (R)	R4720	46660	2/10/1966	167.4 Ac-ft
Joe Hall Creek (S)	4674	4953	6/23/1920	2.5 cfs
Ransom Creek (S)	18123	20734	2/24/1948	0.53 cfs

January 27, 2010

City of Brookings Water Rights Summary

City of Brookings Municipal Supply Water Rights

Application	Permit / Certificate	Type of Use	Source	Priority Date	Rate (cfs)	Volume (AF)	Point of Diversion (POD) Location	Status
S-41805	S-31293 N/A	Municipal	Chetco River	1/22/1966	6.61		Ranney Collector Well	Development timeline expired 10/1/1999; currently in extension process at OWRD.
S-37091	S-27610 83682	Municipal	Chetco River	9/14/1961	4.00		Ranney Collector Well	In use.
G-5869	G-5601 64614	Municipal		8/14/1972	6.00		River Well #1	Currently not in use.
R-41870	R-4720 46860	Municipal	Ferry Creek	2/10/1966		167.40	Ferry Creek	Water being stored.
S-41871	S-31224 46861	Municipal	Ferry Creek Reservoir	2/10/1966		167.40	Ferry Creek Reservoir	Water released from reservoir, not currently being used for potable supply.
S-22928	S-18123 20734	Municipal	Ransom Creek	9/24/1948	0.53			Currently not in use
				Total:	17.14	334.80		

City of Brookings Irrigation Water Rights

Application	Permit / Certificate	Type of Use	Source	Priority Date	Rate (cfs)	Volume (AF)	POD Location	Status
S-71042	S-51383 N/A	Primary irrigation of 180 3 acres on golf course	Chetco River	12/12/1990	1.00		S. bank Chetco River near Freeman property	Use is limited by permit to March 1 through June 30. Development timeline expired 10/1/2002; no extension application pending. Currently not in use and no POD constructed.
R-73396	R-11535 N/A	Storage of water in ten reservoirs for supplemental irrigation on golf course	Chetco River	5/13/1993		62.30	S. bank Chetco River near Freeman property	Development timeline expired 10/1/2002; no extension application pending. Currently not in use and no POD constructed. Numerous permit conditions.
S-73397	S-51595 N/A	Use of stored water from ten reservoirs for supplemental irrigation on golf course	Ten Reservoirs, tributaries of Chetco River	5/13/1993		62.30	Reservoirs on golf course	Development timeline expired 10/1/2002; no extension application pending. Currently not in use and no POD constructed. Numerous permit conditions.
				Total:	1.00	124.60		

Additional Water Rights Identified in October 2007 HGE 'Water System Master Plan Update'

Application	Permit / Certificate	Type of Use	Source	Priority Date	Rate (cfs)	Volume (AF)	POD Location	Status
S-3151	S-1740 2078	Domestic and Industrial / Manufacturing	Ferry Creek	8/22/1913	3.00			Currently not in use
R-5114	R-372 1407	Domestic	Ferry Creek	8/9/1916		1680.00		Currently not in use.
R-5705	R-408 2071	Domestic	Ferry Creek	8/25/1917		28.00		Currently not in use
S-7364	S-4674 4953	Domestic and Industrial / Manufacturing	Joe Hall Creek	6/23/1920	2.50			Currently not in use.
				Total:	5.50	1708.00		

Currently, the Chetco River supplies 100 per cent of the City's water needs through a Ranney type intake collector located approximately 4 miles upstream from the Highway 101 bridge. The pump station at this point of diversion has a rated capacity of 5.4 million gallons per day (mgd). The City installed a new 16-inch raw water line from the point of diversion to the treatment plant in 2008. With this addition, the system now has the capacity to deliver 3.6 mgd to the treatment plant.

~~In 2008, the City received Certificate of Water Right (Permit 27610) for 4.0 cfs at the above referenced intake. In 2010, the City submitted a claim of beneficial use to support its partial perfection application (Permit S-31293) for 1.54 cfs at the above referenced intake.~~

In 2012, Certificates 83682 and 87358 were obtained as part of a negotiated agreement with Oregon Water Resources Department (OWRD) and Waterwatch, and represent the only water rights currently used by the city for municipal water production.

WATER TREATMENT

The water treatment plant, installed in 1976, is a Neptune Microfloc Aquarius Model AQ-300 that utilizes the conventional rapid sand filtration treatment process. The plant consists of two identical, side-by-side units with a combined capacity of approximately 2.6 mgd.

WATER DISTRIBUTION

The main line distribution system consists of approximately 26.5 miles of pipe ranging in size from 2 to 16 inches. Pipe materials vary with the most common types being asbestos cement (AC) and polyvinyl chloride (PVC). The distribution system is over-extended in the higher elevation portions of the service area and is not capable of delivering fire flows in some areas.

WATER USAGE

~~Calendar 2009 water production data shows that the average daily water demand is 1,059,000 gallons with the peak day demand being 2,055,000 gallons. Using an estimate of 6,470 persons for the current population, the average daily water usage per person would be 164 gallons, with a peak demand of 318 gallons per person.~~

Water production data from October 2011 to September 2012 shows that the average daily water demand is 771,503 gallons with the peak day demand being 1,063,052. Using an estimate of 9,934 persons being served water, the average daily water usage per person would be 106.4 gallons.

The City began offering water conservation incentives to customers in 2007, and has reduced its unaccounted-for water usage from 17% in 2007 to **10.1% In 2012.** ~~13.5% in 2009~~.

FIRE FLOWS

The water system must offer sufficient capacity to furnish water for firefighting while maintaining adequate flows for domestic, commercial and industrial demands. In addition, the required fire flow must be delivered at an accepted residual pressure, which is 20 psi. The City of Brookings has adopted the Oregon Fire Code. The Oregon Fire Code provides the minimum fire flow standard applied to new development. A matrix used to determine fire flow requirements can be

P7

found in Oregon Fire Code, Appendix B, Table 105.1- Minimum required fire flow and flow duration for buildings. There is no community-wide standard, although a basic fire flow of 1,500 gpm for a two hour duration is a minimum in the Oregon Fire Code.

WATER STORAGE

With the completion of the 1.6 million gallon Seacrest reservoir in 2009, the current available storage is 3.6656 million gallons, or 1.78 times the peak day demand. The sizing of the Seacrest reservoir was reduced from a proposed 2.0 mg due to site constraints. The City ~~plans to include the remaining 400,000 gallon capacity in a future project near the Brookings airport.~~ **received a grant to fund installation of a .5 mg water reservoir east of the Brookings Airport. Construction is slated to begin on this project in the fall of 2014. The site will accommodate an additional .5 mg reservoir in the future.**

WATER SYSTEM MASTER PLAN

The City adopted a Water System Master Plan Update **prepared by PACE, An Engineering Services Company on (date of adoption).** ~~in 2007, which also serve as the City's Water Conservation Management Plan.~~ These Plans are incorporated herein by reference.

Harbor Water People's Utility District

WATER SOURCE

Currently the Chetco River supplies the Harbor Water Peoples Utility District (HWPUD) water needs. The river intake is a Ranney collector with a rated capacity of 6 million gallons per day. Four pumps serve the intake; each rated at 2.4 mgd capacity. The pumps alternate, with two operating together to handle peak demands.

The HWPUD currently holds two surface water rights from the Chetco River and has two ground water sources. These are summarized in the following table.

Harbor Rural Water District Water Rights			
Source	Priority Date	Amount	Amount
Chetco River	1966	3.500 cfs	2.26 mgd
Chetco River	1980	7.00 cfs	4.53 mgd
Well G3240	1966	3.50 cfs	2.26 mgd
Well G9438	1980	7.00 cfs	4.53 mgd
	Total	21.00 cfs	13.58 mgd

WATER TREATMENT

The Ranney intake is considered equivalent to a ground water system. For this reason, water treatment is not practiced.

WATER DISTRIBUTION

The distribution system is an extensive loop system that extends from the Chetco River to the California border, and consists of approximately 50-55 miles of pipe ranging in size from 2 to 16 inches. Pipe materials vary with the most common types being asbestos cement (AC) and polyvinyl chloride (PVC), and ducitile pipe.

WATER USAGE

Current water production data shows that the average daily water demand is 700,000 gallons with the peak day demand being 1,700,000 gallons. Serving an estimated 2,500 persons, the current population, the average daily water usage per person is approximately 280 gallons, with a peak demand of 680 gallons.

FIRE FLOWS

The water system must offer sufficient capacity to furnish water for fire fighting while maintaining adequate flows for domestic, commercial, and industrial demands. Also the required fire flow must be delivered at an accepted residual pressure which is 20 psi. The HWPUD has sufficient storage to meet a demand of 1500 gpm for two hours where necessary. The necessary storage to meet that requirement would be 180,000 gallons. HWPUD has the capacity to deliver fire flows.

WATER STORAGE

There are eleven water storage reservoirs in the HWPUD, which give a total storage capacity of 2,060,000 gallons. The following table summarizes the current water storage for the district.

Harbor Water District Storage			
Reservoir	Bottom Elevation	Overflow Elevation	Storage Capacity
Crown Terrace 1	525.5'	537.5'	10,000 gal
Crown Terrace 2	525.5'	537.5'	10,000 gal
Crown Terrace 3	795'	807'	10,000 gal
Crown Terrace 4	795'	807'	10,000 gal
Crown Terrace 5	1,025'	1,037'	10,000 gal
Crown Terrace 6	1,025'	1,037	10,000 gal
Hallway 1	201.36'	234.81'	750,000 gal
Hallway 2	203.62'	234.81'	500,000 gal
Coleman	355.18'	388.60'	300,000 gal
Benham	355.18'	386.60'	200,000 gal
Freeman	203.32'	234.74'	250,000 gal
TOTAL			2,060,000 gal

The required storage for the HWPUD is shown in the following table.

Harbor Water Storage Estimate		
Peak Day Demand	1,700,000 gallons	
Twice the Ave Day Demand	1,400,000 gallons	
Larger of the above two		1,700,000 gallons
Fire Storage	1500 gpm x 2hrs	180,000 gallons
Equalization Storage	20% peak	340,000 gallons
	Required Storage	2,220,000 gallons

HARBOR WATER PUD MASTER PLAN
Harbor Water PUD adopted a Master Plan in December, 2000 that is incorporated herein by this reference.

CITY OF BROOKINGS WASTEWATER SYSTEM

The original Brookings sewer system was constructed about 1916 and service was initially limited to the downtown area. The City assumed operation of the sewer system soon after incorporation in 1951. The City operates the wastewater system as a City business enterprise. The wastewater enterprise consists of the following operating systems:

COLLECTION

The City accepts domestic sewage from property in the service area that is connected to the sanitary collection system, and transmits the sewage to the wastewater treatment plant. The collection function includes the operation of sewage lift stations installed at various locations within the collection system to assist the flow of sewage to the treatment plant.
Currently, the collection system consists of a network of 6, 8, 10 and 12-inch mains connected to 18 and 21-inch interceptors and lift stations. There are approximately 32.7 miles of 6-inch to 21-inch gravity mains and 2.75 miles of 4-inch to 14-inch diameter force mains in the collection system. The system provides service connections to individual properties within the service area. The interconnection with the HSD also functions as a part of the collection system.

LIFT STATIONS

The City currently operates 13 lift/pump stations located to serve areas which cannot be served with gravity-fed sewer mains.

TREATMENT

Treatment involves removal of solids from the sewage received at the wastewater treatment plant, and clarification of processed solids after biological treatment and disinfect using U.V. bulbs in the effluent stream, to meet federal and state standards prior to discharge into the ocean. Treatment includes the processing, reprocessing and disposal of solids removed from the sewage.

The wastewater treatment plant has been located at Chetco Point since the early 1950's. Major modifications to the plant were made in 1973, 1991, and 2000.

Treated water, or effluent, produced by the wastewater treatment plant is discharged to the Pacific Ocean. The Oregon Department of Environmental Quality establishes discharge limitations for discharge to ocean waters. The residual of the solids removal process, or sludge, is currently taken from the bio-solids storage tank and transported to a processing facility in Grants Pass during the summer months. Approximately 1,598,040 gallons of sludge was

transported for disposal in 2009. A new Class B sludge dewatering facility is planned for construction during 2010-11 which will eliminate the need for sludge trucking to Grants Pass.

RELATIONSHIP TO HARBOR SANITARY DISTRICT

In 1976, the Harbor Sanitary District was formed to serve an area just south of the City. The City and HSD have entered into a series of intergovernmental agreements whereby the City accepts sewage from HSD for treatment. See below for a description of the HSD system.

BROOKINGS WASTEWATER MASTER PLAN

The City adopted a Wastewater Facilities Master Plan in March, 2008. That Master Plan is incorporated herein by reference. A detailed discussion of the treatment system and plant capacity can be found in the Plan. Until sewer service can be extended to properties, interim urban-level treatment systems may be allowed only if specifically provided for in master plans which set forth appropriate standards and conditions and which have been adopted as post-acknowledgement plan amendments or periodic review work task elements.

HARBOR SANITARY DISTRICT WASTE WATER SYSTEM

The community of Harbor is an unincorporated residential, commercial, and industrial area south of the Chetco River and the City of Brookings. The Harbor Sanitary District (HSD) has served this area since June 1976. The HSD operates only a collection system. Wastewater is piped to the Brookings wastewater treatment plant for treatment. The area's land use is predominantly residential, but a regional shopping center and an extensive commercial and industrial complex surround the Brookings-Harbor Boat Basin. The Harbor Bench area south of Harbor, an area experiencing steady growth, currently is out of the sewer service area; however, it is an area that potentially may become part of the service area. In 1979 the Oregon Health Division directed the HSD to annex an adjoining area, the Oceanview Mobile Home Estates, due to wastewater treatment concerns.

POPULATION

The following population data was taken from the "City of Brookings Comprehensive Utilities Plan" dated September 1981. Population projections were based on the 1970s, a growth period.

Harbor Sanitary District Population Growth				
Year	1980	1990	2000	2010
Population	1,968	2,645	3,555	2,770

COLLECTION SYSTEM

In 1976, the HSD was formed. The collection system consists of four pump stations and a network of gravity lines. Wastewater is pumped across the Chetco River to the south portion of

the City of Brookings service area. There a 20-inch gravity main conveys the wastewater to the Brookings treatment plant. The daily flow rate is approximately 0.28 mgd.

The collection system consists of 16.5 miles of 8-inch and 12-inch transite pipe.

PUMP STATIONS
Flows from the entire Harbor collection system enter HSD pump station No. 14. Discharge from this station is to the Brookings WWTP by means of an 8-inch force main over the Chetco River or a 12-inchforce main under the Chetco River. Space for additional force mains is available. Pump station No. 14 is rated at 2,000 gpm and 125 feet. The other three pump stations are small and serve limited areas.

HARBOR SANITARY DISTRICT MASTER PLAN
HSD plans to complete a Master Plan during the winter of 2010.

Until sewer service can be extended to properties, interim urban-level treatment systems may be allowed only if specifically provided for in master plans which set forth appropriate standards and conditions and which have been adopted as post-acknowledgement plan amendments or periodic review work task elements.

CITY OF BROOKINGS STORM DRAINAGE

The City of Brookings operates a storm drainage system within the city boundaries. Drainage basins flow to the ocean or the Chetco River. Generally local area flows are conveyed via pipes to discharge points at surface drainage ways. The majority of the existing piping system is located in the western old portions of the city draining to the Chetco. Highway 101 presents a major flow obstruction to natural drainage pattern, requiring culvert crossings. Some limited historical flooding has occurred, but the problems are related to site-specific causes.

CURRY COUNTY
Curry County services all public storm drainage in the study areas north and south of the Chetco outside City limits. The service level is mainly rural road maintenance that consists of ditch culvert cleaning associated with road maintenance. All other drainage features are privately owned. The Harbor Bench area, which is outside the urban growth area, has experienced flooding and erosion due to upstream growth and diversion of flows due to culvert placement.

CITY/ COUNTY STORM DRAINAGE MASTER PLAN
On January 12, 2009, the City and the County adopted the "Storm and Surface Water Facilities Plan for Brookings-Harbor Area." In the Plan are design and development standards and proposed improvements to the storm drainage facility. There are also maps depicting the various basin areas in City limits and the Urban Growth Area, hydrologic/ hydraulic analysis, and the discussion of the effects on specific areas in the Plan. The Plan is hereby incorporated by this reference.

The Storm and Surface Water facilities Plan for Brooking Harbor Area" contains the following policies:

- Low impact development is preferred.
- Negative impacts to natural watercourses are to be avoided.
- Piping of a natural watercourses is to be avoided, where practicable.
- Protection of ground water sources is critical.
- Proposed facilities should address water quality impacts and mitigation measures.
- Erosion and sediment must be controlled using the City, County, and Department of Environmental Quality requirements.
- Stormwater discharges shall be maintained at current levels.
- A public education program is recommended to disseminate information on the importance of preventing negative impacts from stormwater.

The "Storm and Surface Water Facilities Plan for Brookings-Harbor Area" contains specific design and development standards and proposed improvements to the storm drainage facility. To avoid adverse impacts created by development, the Plan contains five strategies to be generally utilized:

1. There should be no post-development net increase in storm drainage discharge downstream.
2. Low impact development practices as described in the 2007 "Storm and Surface Water Facilities Plan" shall be implemented.
3. The capacity of the downstream drainage infrastructure is improved to convey the increased flow. Usually this means constructing larger culverts and storm drains. Generally, the natural drainage channels are improved, but because of the study area's proximity to the ocean and the steep rocky terrain, these channel improvements may not be necessary.
4. A regional detention facility is constructed to capture the additional runoff and release the flow at a slower natural rate. A regional facility is normally associated with a single drainage way or creek.
5. An onsite detention facility is constructed for each individual development. The goal for a regional or onsite detention facility is that the runoff from the post-development condition be reduced to flow equaling the pre-development condition.

The Harbor Hills Master Plan Area within the UGA is required to prepare a comprehensive surface water management plan prior to any land use approvals. The details required and the review and approval process are described in the "City of Brookings and Curry County Joint Management Agreement", dated June 30, 2010.

BROOKINGS HARBOR
URBAN GROWTH AREAS
URBAN GROWTH BOUNDARY
BROOKINGS CITY LIMITS
OCEAN
PACIFIC
CITY OF BROOKINGS
W&H PACIFIC

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GOAL 11 PUBLIC FACILITIES AND SERVICES

GOAL:

To plan and develop a timely, orderly and efficient arrangement of public facilities and services to provide a framework for urban and rural development.

FINDINGS:

1. The City has adopted a Public Facilities and Services Plan that establishes the framework for the distribution of water and sanitary sewer services and storm drainage systems throughout the expanded Urban Growth Boundary.

2. The City has adopted a Water Master Plan/Conservation Management Plan. **On (adoption date), the City adopted "City of Brookings Water Master Plan Update". This update included data in the appendices from the 2007 "Water System Master Plan Update" regarding the Harbor Water People's Utility District which serves the Brookings Urban Growth Area south of the Chetco River Bridge.**

3. The City has adopted a Water Curtailment ordinance that provides the city with the mechanisms to curtail water use in emergencies, including low surface water flows in the Chetco River.

4. On January 12, 2009, the City adopted the "Storm and Surface Water Facilities Plan for Brookings-Harbor Area." New policies from this Plan are found in the "Public Facilities Plan for Urban Growth Expansion."

5. In March, 2008, the City adopted a Wastewater Facility Plan.

6. The city currently provides the following facilities and services within the City Limits:

   A. Public Works

      1) Water Treatment - 2.~~2~~ **0** to 2.6 mgd capacity.
      2) Water Distribution, Pumping and Storage - (Total connections **3,354** ~~3,131~~; ~~2,711 within the city limits and 420 out side city limits, June 30, 2010).~~ **3,053 of the connections are residential, 2012).**
      3) Wastewater Treatment – 15.4 mgd peak wet weather capacity. The yearly average flow is 1.42 mgd. The service area includes the incorporated area of Brookings plus the Harbor Sanitary District to the South. (Total of 2,228 connections within the City limits. The Harbor Sanitary District has approximately 895 connections, which are pumped to the City's treatment plant, July 8, 2010).

4) Wastewater Collection and Pumping - All public facilities within the city limits are the responsibility of the City of Brookings. All such facilities in the Harbor Sanitary District are owned, operated and maintained by that district.
5) Street and Infrastructure Maintenance - The City's Public Works Department provides maintenance of City streets, water mains, sewer mains, storm drains, and other infrastructure systems.

B. Solid Waste Removal - is presently done by franchised contract

C. Fire Prevention and Protection Services

These services are provided with two paid employees (Chief and Assistant Chief) and 40 volunteers. Ratings outlined in the Inventory document show an adequate program with primary need being in the area of improved water system.

D. Police Protection

1) Existing police facilities in the city hall are presently adequate as a base of operations.

2) If population growth exceeded significantly the number projected or if the city boundaries were considerably expanded through annexation, or if the incident of crime jumped radically, it is conceivable that new facilities and additional manpower might be required.

E. Parks and Recreation Facilities and Services

1) One state park, Harris Beach State Park, is located within the City of Brookings. See adopted Harris Beach Master Plan, 2003.
2) The city owns and maintains approximately 54.4 acres of parkland.
   a. Azalea Park (formally Azalea State Park)
      - 33 ".2 acres
      - 2 Softball fields
      - Outdoor amphitheater/bandshell
      - 2 Volleyball Courts
      - Kidtown (.25 ac.)
      - Walking and biking trails
      - Capella by the Sea (weddings and passive meditation)
      - Gazebo
      - -4 Horseshoe pits
      - -2 Bar-ba-que grills
      - -11 Picnic tables
      - -Flower garden/natural area
      - -Restroom facilities
      - -Snack shack
   b. Bud Cross Park
      - 6.4 acres
      - 3 lighted tennis courts
      - 2 baseball fields
      - swimming pool and bathhouse
      - restroom facilities
      - concession stand
      - -Skate park
      - -3 Picnic tables
      - -Basketball courts
   c. Chetco Point Park

- 8.9 acres
- walking trails
- 5 picnic tables
- ocean access/ beach access
- 4 Horseshoe pits
- Fire pit
- Restroom facilities
- 4 Seating benches

d. Easy Manor Park
   - .8 acres
   - 2 Bar-ba-que grills
   - playground facilities (remodeled in 2010)
   - 4 Picnic tables
   - Restroom facilities
   - 4 Seating benches

e. Stout Park
   - 3.3 acres
   - Manley Arts Center
   - walking paths
   - 8 Seating benches
   - Model railroad garden

f. Numerous mini parks around the City (pocket parks).

3) The City adopted a Parks Master Plan in Aug., 2002. This Plan is incorporated herein by reference.

F. Other facilities and services provided in the City of Brookings are

1) Schools
2) Transportation for the elderly.
3) Regional recreational facilities such as state parks and harbor facilities.

7. The following entities will provide services outside of the city limits within the Urban Growth Boundary.

A. Wastewater Collection

1) The Harbor Sanitary District.
   a. Collects wastewater within their district south of the Chetco River and pumps to the City's wastewater treatment plant.
   b. Has stated, expansion of the District will only occur when it is in compliance with the Districts adopted Growth Management Policy (Resolution 07-18-R).
2) The City of Brookings
   a. Will provide wastewater collection in the Urban Growth Boundary, south of the Chetco River outside of the Harbor Sanitary District boundaries when land is annexed to the city.
   b. Will provide wastewater collection in the Urban Growth Boundary north of the Chetco River when land is annexed to the city.

B. Water Distribution

1) The Harbor Water District People's Utility District
   a. Pumps from an intake on the south bank of the Chetco River.
   b. District boundaries include the entire Urban Growth Boundary expansion south of the Chetco River except for the areas north of its

intake facility and the top of the Harbor Hills.

c. Is willing to expand its boundaries to include the entire Urban Growth Boundary south of the Chetco River.

2) The City of Brookings

a. The City currently provides water service to some areas of the Urban Growth Boundary north of the Chetco River.

b. The City will provide service to the entire Urban Growth Boundary north of the Chetco River.

c. Due to City Charter language, the City must provide water service to properties in the Urban Growth Area that want to annex unless the legal voters of the City authorize another water provider to serve.

C. Fire Protection

1) Brookings Rural Fire Protection District.

a. Is located around the City in the area north of the Chetco River.

b. Is served under contract by the Brookings Fire Department

2) Harbor Rural Fire Protection District

a. Provides service to the entire Urban Growth Boundary south of the Chetco River.

b. Fire station is located on Benham Lane.

D. Police protection

All of the Urban Growth Boundary outside of the city limits is provided police protection by the Curry County Sheriff's Department.

E. Storm Drain Maintenance

1) The Oregon Department of Transportation maintains all drainage facilities within a state road or highway rights-of-way.

2) The Curry County Road Department maintains all drainage facilities within county road or street rights-of-way.

3). Drainage facilities on private property are maintained by the property owner.

POLICIES:

To insure timely, orderly and efficient arrangement of public facilities and services the following policies will be implemented by the City of Brookings.

1. Public Works

A. Water treatment facilities. Facilities will be maintained with the proper observation and planning to expand facilities on a timely basis to provide continued service to existing customers and projected growth. Expansion programs will be funded through the most cost-effective methods utilizing all available federal, state and local funds.

B. Water distribution, pumping and storage. New development requiring extension of water mains, pumping and storage facilities will be paid for and constructed by the developer pursuant to the provisions of the current City of Brookings ~~Standard Specifications~~ **Engineering Requirements and Standard Specifications for Public Works Infrastructure** document.

C. Water Master Plan/Conservation Management Plan. The City will maintain a Water Master Plan/Water Conservation Management Plan, which will be updated as required.

D. A Backflow Prevention Program was adopted in 2012.

~~D~~**E.** Wastewater treatment facility. Expansion programs will be funded through the most cost-effective methods utilizing all available federal, state and local funds.

~~E~~**F.** Wastewater collection facilities. New development requiring extension of sewer mains and new pumping stations will be paid for and constructed by the developer pursuant to the provisions of the current City of Brookings ~~Standard Specifications~~ **Engineering Requirements and Standard Specifications for Public Works Infrastructure** document.

~~F~~**G.** Streets and other infrastructure facilities. The City's Public Works Department will inspect and maintain all public street and subsurface infrastructure facilities. The extension of existing streets for new development shall be paid for and constructed by the developer pursuant to the provisions of the current City of Brookings ~~Standard Specifications~~ **Engineering Requirements and Standard Specifications for Public Works Infrastructure** document.

~~G~~**H.** Storm drain facilities. New development requiring new storm drain systems or the extension of existing systems including provision of detention basins, will be paid for and constructed by the developer pursuant to the provision of the current City of Brookings ~~Standard Specifications~~ **Engineering Requirements and Standard Specifications for Public Works Infrastructure** document.

2. Fire Prevention and Protection

The Fire Chief will continue to serve as the head of prevention and protection services. He will continue to maintain the high level of training and service that the community has come to expect through the conduct of local and regional

training sessions and a continued education for himself.

3. Police Protection

The Chief of Police shall be responsible for continually monitoring the department's facility requirements and operations. In conjunction with the annual preparation of his budget request, a written evaluation shall be prepared for the City Manager, who in turn, may call attention to specific items for consideration by Planning Commission, Council or staff.