City Of Banks

G-8476

Name City of Banks, Oregon

By

Address City Hall
Banks, Oregon 97106

Date filed 29 September 1977

Priority Sept. 29, 1977

Action suspended until

Return to applicant

Date of approval DEC 2 1977

CONSTRUCTION

Date for beginning DEC 2 1978

Date for completion OCT 1 1979

Extended to 10-1-2017

Date for application of water OCT 1 1980

Extended to 10-1-2017

PROSECUTION OF WORK

Form "A" filed Started

Form "B" filed Dec 11, 1980

Form "C" filed Dec 11, 1980

FINAL PROOF

Blank mailed

Proof received 9/13/2021

Date certificate issued

Application No. G 8476

Permit No. G 7593

Certificate No.

Stream Index, Page No. 2-162

FEES PAID

Date	Amount	Receipt No.
9-29-77	35.00	64202
5-17-07	250.00	87626
9-13-2021	230.00	136395
	Cert. Fee	

FEES REFUNDED

Date	Amount	Check No.
3/22/2023	$894.00	VP055436

ASSIGNMENTS

Date	To Whom	Address	Volume	Page

REMARKS

CARD FOR B OCT 25 1979

CARD FOR C OCT 24 1980

T-10055 APoA

SP*70900-119

Form C (690—9-77)

IMPORTANT—This form is a notice to the Water Resources Director that permittee is ready to make **final proof** to the extent to which the water has actually been applied to the intended use under the terms of the permit. Permittee is cautioned that Certificate of Water Right will be issued based on the extent of the quantity and use as determined by the **final proof** inspection and survey which will be made in response to the filing of this Form C.

NOTE: In the case of an irrigation permit, this Form C should not be mailed to the Water Resources Department until all of the land described in the permit, which it is intended to irrigate under this permit at any time, has actually been irrigated.

Fill out, detach and mail to the Water Resources Department, Salem, OR 97310, when all of the water has been applied.

Application No. G8476

RECEIVED DEC 04 1980 WATER RESOURCES DEPT SALEM, OREGON

OK AGK 11-14-80 See letter

NOTICE OF COMPLETE APPLICATION OF WATER TO A BENEFICIAL USE

I, CITY OF BANKS, OREGON, the holder of Permit No. G7593

to appropriate the public waters of the state of Oregon, completely applied the waters to a beneficial use in accordance with the terms of said permit, on the 1st day of OCTOBER, 1980

Remarks: Water was used beginning June 13th, 1980 to funish water for the State of Oregon for ash removal - On line and operating fully October 1st., 1980

IN WITNESS WHEREOF, I have hereunto set my hand this 1st day of December, 1980

Howard D. Stentbach, Mayor (Signature of Applicant) City of Banks, Banks, Or 97106 (Address)

Form B (690—9-77)

Application No. G8476

NOTICE OF COMPLETION OF CONSTRUCTION

I, CITY OF BANKS, OREGON, the holder of Permit No. G7593

to appropriate the public waters of the state of Oregon, completed the construction of the works described therein on the 30th day of OCTOBER, 19 79

RECEIVED DEC 11 1980 WATER RESOURCES DEPT SALEM, OREGON

Remarks: If the works have less capacity than described in the permit, or you have definitely abandoned part of the proposed development, you should so state in order that our records may not be unnecessarily encumbered.

OK AGK

IN WITNESS WHEREOF, I have hereunto set my hand this 2 day of December, 1980

Howard D. Stentbach Mayor (Signature of Applicant) City of Banks (Address) Banks, Or. 97106

Fill out, detach and mail to the Water Resources Department, Salem, OR 97310, when construction work is completed.

Oregon
Kate Brown, Governor

Water Resources Department
North Mall Office Building
725 Summer St NE, Ste A
Salem, OR 97301
Phone: 503-986-0900
Fax: 503-986-0904
www.Oregon.gov/OWRD

February 08, 2022

ANGIE LANTER
PUBLIC WORKS
CITY OF BANKS
13680 NW MAIN STREET
BANKS, OR 97106

GW

The Department has reviewed the status of your pump test and any requests for extension(s) or exemption(s) for the following permitted well(s). The results are summarized in the following table:

Application	Water Right	Permitted Well	Pumped Well	Test Date	Request Status	Exemption	Well Name
G 8476	Permit: G 7593 *	WASH0007651	WASH0062373	03/18/2009	APPROVED	Public Supply	CITY OF BANKS WELL 1

Please contact me if you have any questions.

Sincerely,

Ben Scandella

Ben Scandella
503-437-5231
Groundwater Section

cc: GW Pump Test File
cc: Certificates Section/Application File

OREGON WATER RESOURCES DEPARTMENT

RECEIVED
MAR 29 2021
OWRD

PUMP TEST UNREASONABLE BURDEN EXEMPTION REQUEST FORM

OWNER NAME/BUSINESS NAME:	PHONE NO.:	ADDITIONAL CONTACT NO.:
City of Banks	503-324-5112	Bob Long PG CWRE 503-799 0304
ADDRESS: 13680 NW Main Street		
CITY: Banks / STATE: OR / ZIP: 97106	E-MAIL: jbecker@cityofbanks.org	

If there is a reason why a pump test cannot be performed on a well, the owner may request from the Director an exemption from the pump test requirement. Requests shall be in writing and include the reason why a pump test cannot be performed. Exemptions, or conditioned exemptions, shall be granted if the reasons are found to valid and eliminating the problem would place an unreasonable burden on the well owner. Exemptions shall be granted for public water supply wells if pump testing will cause interruption of service to customers. OAR 690-217-0015(3).

1. List each well and associated water right(s) for which you are requesting an exemption. If a well is listed on more than one water right, be sure to include them all here. If additional space is needed, please attach another form. If available, please attach all water well reports (i.e. well logs) and a map showing the locations of all wells listed on this form.

	WELL LOG # (EX. MAR 99999)	WELL TAG # (EX. L-999999)	WELL NAME OR #	APPLICATION	PERMIT	TRANSFER
a	WASH 7651	L-	Well 1 or Behrman Well	G- 8476	G- 7593	T- 10055
b		L-		G-	G-	T-
c		L-		G-	G-	T-
d		L-		G-	G-	T-
e		L-		G-	G-	T-

(CONTINUED)

	TWP (EX: 25S)	RNG (EX: 31E)	SEC (EX: 12)	QQ (EX: SE/SW)	SURVEYED LOCATION (Ex: 100 ft N & 735 ft E fr SE cor, sec 5)	LATITUDE (EX: 44.94473859)	LONGITUDE (EX: -123.02787000)
a	2N	3W	31	NENW	135 FT S. and 560 FT W. from NW corner of Sect. 31	~45.6212	~123.1066
b							
c							
d							
e							

2. Please explain why the test cannot be performed:

The City of Banks uses both Well 1 and Well 2 to meet its municipal water requirements.

Well 1 (WASH 7651) is located approximately 67 feet from Well 2 (WASH 62373).

Due to their close proximity, the two wells produce water from shared water-bearing zones. Any pump test on one well requires the other to remain off for an extended period.

A 47-hour 465 gallon per minute (gpm) constant-rate pump test was performed on Well 2 (WASH 62373). The results of this pump test on are on file with OWRD.

In lieu of idling Well 2 for a pump test on Well 1, the results of Well 2's pump test are respectfully submitted as a better overall representation of the characteristics of the basalt aquifer in this area.

I hereby certify that the well(s) requested for exemption(s) are under my ownership.

SIGNATURE: RG CWRE DATE: 3/29/2021

Robert E. Long Jr.

The original and first copy of this report are to be filed with the WATER RESOURCES DEPARTMENT, SALEM, OREGON 97310 within 30 days from the date of well completion.

WATER WELL REPORT
STATE OF OREGON
(Please type or print)

RECEIVED
SEP - 6 1977
WATER RESOURCES DEPT. SALEM, OREGON
(Do not write above this line)

WASH 4651

State Well No. 2N/3W-31

State Permit No.

(1) OWNER:
Name City of Banks
Address Banks, Oregon

(2) TYPE OF WORK (check):
New Well ☒ Deepening ☐ Reconditioning ☐ Abandon ☐
If abandonment, describe material and procedure in Item 12.

(3) TYPE OF WELL:
Rotary ☒ Driven ☐
Cable ☐ Jetted ☐
Dug ☐ Bored ☐

(4) PROPOSED USE (check):
Domestic ☐ Industrial ☐ Municipal ☒
Irrigation ☐ Test Well ☐ Other ☐

(5) CASING INSTALLED: Threaded ☐ Welded ☒
8-5/8" Diam. from plus 2 ft. to 210 ft. Gage .250
" Diam. from ft. to ft. Gage
" Diam. from ft. to ft. Gage

(6) PERFORATIONS: Perforated? ☐ Yes ☒ No
Type of perforator used
Size of perforations in. by in.
perforations from ft. to ft.
perforations from ft. to ft.
perforations from ft. to ft.

(7) SCREENS: Well screen installed? ☐ Yes ☒ No
Manufacturer's Name
Type Model No.
Diam. Slot size Set from ft. to ft.
Diam. Slot size Set from ft. to ft.

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(8) WELL TESTS: Drawdown is amount water level is lowered below static level
Was a pump test made? ☒ Yes ☐ No If yes, by whom? AMJannsen
Yield: 275 gal./min. with 224 ft. drawdown after 48 hrs.
150 " 146 " "
" " " "
Bailer test gal./min. with ft. drawdown after hrs.
Artesian flow g.p.m.
Temperature of water 58° Depth artesian flow encountered ft.

(9) CONSTRUCTION:
Well seal—Material used Cement grout & 2% gel
Well sealed from land surface to 210 ft.
Diameter of well bore to bottom of seal 12-1/4" in.
Diameter of well bore below seal 8" in.
Number of sacks of cement used in well seal 25 sacks
How was cement grout placed? Placed on o.d. of casing & through grout pipe - 20 sacks run @ 210', 5 sacks run to top off at ground level upon completion
Was a drive shoe used? ☐ Yes ☒ No Plugs Size: location ft.
Did any strata contain unusable water? ☒ Yes ☐ No
Type of water? insufficient depth of strata 130' to 160'
Method of sealing strata off cased and cemented
Was well gravel packed? ☐ Yes ☒ No Size of gravel:
Gravel placed from ft. to ft.

(10) LOCATION OF WELL:
County Washington Driller's well number
¼ ¼ Section 31 T. 2 N R. 3 W. W.M.
Bearing and distance from section or subdivision corner

(11) WATER LEVEL: Completed well.
Depth at which water was first found 130 ft.
Static level 84 ft. below land surface. Date 8/24/77
Artesian pressure lbs. per square inch. Date

(12) WELL LOG: Diameter of well below casing 8"
Depth drilled 450 ft. Depth of completed well 450 ft.

Formation: Describe color, texture, grain size and structure of materials; and show thickness and nature of each stratum and aquifer penetrated, with at least one entry for each change of formation. Report each change in position of Static Water Level and indicate principal water-bearing strata.

MATERIAL	From	To	SWL
Dark brown clay topsoil	0	8	
Silty brown clay	8	15	
Red-brown clay w/rotten rock fragments	15	50	
Sticky red clay-occ. rotten rock streaks	50	95	
Brown clay & rotten rock	95	110	
Dark brown & gray-brown clay --organic material	110	120	
Soft blue-gray cemented gravel	120	130	
Rotten brown basalt	130	160	20 gpm
Soft brown basalt-occ.weathered	160	195	
Black-brown basalt	195	215	
Hard gray-black basalt	215	230	
Broken brown basalt w/soapstone and lava interbeds	230	245	10 gpm
Fractured black basalt--occ. crevice	245	265	
Hard gray-black basalt, occ-			

Work started 8/16/77 19 Completed 8/24/77 19
Date well drilling machine moved off of well 8/24/77 19

Drilling Machine Operator's Certification:
This well was constructed under my direct supervision. Materials used and information reported above are true to my best knowledge and belief.
[Signed] (Drilling Machine Operator) Date 8/29/77, 19
Drilling Machine Operator's License No. 523

Water Well Contractor's Certification:
This well was drilled under my jurisdiction and this report is true to the best of my knowledge and belief.
Name A. M. Jannsen Drilling Co. (Person, firm or corporation) (Type or print)
Address 21075 SW Tualatin Valley Hwy. Aloha, Orego
[Signed] Edward M. Jannsen (Water Well Contractor)
Contractor's License No. 79 Date 8/29/77, 19

(USE ADDITIONAL SHEETS IF NECESSARY)

SP*45656-119

NOTICE TO WATER WELL CONTRACTOR
The original and first copy of this report are to be filed with the WATER RESOURCES DEPARTMENT, SALEM, OREGON 97310 within 30 days from the date of well completion.

RECEIVED
SEP - 6 1977
WATER RESOURCES DEPT.
SALEM, OREGON

WATER WELL REPORT
STATE OF OREGON
(Please type or print)
(Do not write above this line)

State Well No. 2N/3W-31

State Permit No. _____

(1) OWNER:
Name City of Banks Page 2

Address _____

(2) TYPE OF WORK (check):
New Well ☐ Deepening ☐ Reconditioning ☐ Abandon ☐

If abandonment, describe material and procedure in Item 12.

(3) TYPE OF WELL:
Rotary ☐ Driven ☐
Cable ☐ Jetted ☐
Dug ☐ Bored ☐

(4) PROPOSED USE (check):
Domestic ☐ Industrial ☐ Municipal ☐
Irrigation ☐ Test Well ☐ Other ☐

(5) CASING INSTALLED:
Threaded ☐ Welded ☐

_____" Diam. from _____ ft. to _____ ft. Gage _____
_____" Diam. from _____ ft. to _____ ft. Gage _____
_____" Diam. from _____ ft. to _____ ft. Gage _____

(6) PERFORATIONS:
Perforated? ☐ Yes ☐ No.

Type of perforator used _____

Size of perforations _____ in. by _____ in.

_____ perforations from _____ ft. to _____ ft.
_____ perforations from _____ ft. to _____ ft.
_____ perforations from _____ ft. to _____ ft.

(7) SCREENS:
Well screen installed? ☐ Yes ☐ No

Manufacturer's Name _____

Type _____ Model No. _____

Diam. _____ Slot size _____ Set from _____ ft. to _____ ft.
Diam. _____ Slot size _____ Set from _____ ft. to _____ ft.

(8) WELL TESTS:
Drawdown is amount water level is lowered below static level

Was a pump test made? ☐ Yes ☐ No If yes, by whom?

Yield: _____ gal./min. with _____ ft. drawdown after _____ hrs.
" " " "
" " " "

Bailer test _____ gal./min. with _____ ft. drawdown after _____ hrs.

Artesian flow _____ g.p.m.

Temperature of water _____ Depth artesian flow encountered _____ ft.

(9) CONSTRUCTION:
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Well seal—Material used _____

Well sealed from land surface to _____ ft.

Diameter of well bore to bottom of seal _____ in.

Diameter of well bore below seal _____ in.

Number of sacks of cement used in well seal _____ sacks

How was cement grout placed? _____

Was a drive shoe used? ☐ Yes ☐ No Plugs _____ Size: location _____ ft.

Did any strata contain unusable water? ☐ Yes ☐ No

Type of water? _____ depth of strata _____

Method of sealing strata off _____

Was well gravel packed? ☐ Yes ☐ No Size of gravel: _____

Gravel placed from _____ ft. to _____ ft.

(10) LOCATION OF WELL:
County _____ Driller's well number _____

¼ ¼ Section T. R. W.M.

Bearing and distance from section or subdivision corner

(11) WATER LEVEL: Completed well.
Depth at which water was first found _____ ft.

Static level _____ ft. below land surface. Date _____

Artesian pressure _____ lbs. per square inch. Date _____

(12) WELL LOG:
Diameter of well below casing _____

Depth drilled _____ ft. Depth of completed well _____ ft.

Formation: Describe color, texture, grain size and structure of materials; and show thickness and nature of each stratum and aquifer penetrated, with at least one entry for each change of formation. Report each change in position of Static Water Level and indicate principal water-bearing strata.

MATERIAL	From	To	SWL
fracture	265	315	5 gpm
Brown basalt-occ.broken	315	325	10 gpm
Hard black & gray-black basalt-occ. crevice	325	360	
Black basalt--occ. broken w/ green soapstone	360	380	25 gpm
Broken black & brown basalt-w/ lava & soapstone interbed	380	400	200 gpm
Broken gray-brown basalt w/ lava streaks	400	415	100gpm
Hard gray-black basalt--occ. crevice	415	450	

Work started _____ 19 Completed _____ 19

Date well drilling machine moved off of well _____ 19

Drilling Machine Operator's Certification:
This well was constructed under my direct supervision. Materials used and information reported above are true to my best knowledge and belief.

[Signed] _____ Date _____, 19_____
(Drilling Machine Operator)

Drilling Machine Operator's License No. _____

Water Well Contractor's Certification:
This well was drilled under my jurisdiction and this report is true to the best of my knowledge and belief.

Name _____
(Person, firm or corporation) (Type or print)

Address _____

[Signed] _____
(Water Well Contractor)

Contractor's License No. _____ Date _____, 19_____

(USE ADDITIONAL SHEETS IF NECESSARY)

SP*45656-119

Name City of Banks
Address 100 South Main Street
City Banks State Or Zip 97106

(2) TYPE OF WORK ☒ New Well
☐ Deepening ☐ Alteration (repair/recondition) ☐ Abandonment ☐ Conversion

(3) DRILL METHOD
☒ Rotary Air ☒ Rotary Mud ☐ Cable ☐ Auger ☐ Cable Mud
☐ Other

(4) PROPOSED USE
☐ Domestic ☒ Community ☐ Industrial ☐ Irrigation
☐ Thermal ☐ Injection ☐ Livestock ☐ Other

(5) BORE HOLE CONSTRUCTION Special Construction: ☐ Yes ☒ No
Depth of Completed Well 665 ft.
Explosives used: ☐ Yes ☒ No Type Amount

BORE HOLE Diameter	From	To	SEAL Material	From	To	Sacks or Pounds
16	0	300	Cem/Bent	0	300	115 sks
12	300	665				

How was seal placed: Method ☐ A ☒ B ☒ C ☐ D ☐ E
☐ Other
Backfill placed from ft. to ft. Material
Gravel placed from ft. to ft. Size of gravel

(6) CASING/LINER

	Diameter	From	To	Gauge	Steel	Plastic	Welded	Threaded
Casing:	12	+2	300	.250	☒	☐	☒	☐
					☐	☐	☐	☐
					☐	☐	☐	☐
					☐	☐	☐	☐
Liner:					☐	☐	☐	☐
					☐	☐	☐	☐

Drive Shoe used ☐ Inside ☐ Outside ☒ None
Final location of shoe(s)

(7) PERFORATIONS/SCREENS
☐ Perforations Method
☐ Screens Type Material

From	To	Slot Size	Number	Diameter	Tele/pipe size	Casing	Liner
						☐	☐
						☐	☐
						☐	☐
						☐	☐
						☐	☐

(8) WELL TESTS: Minimum testing time is 1 hour
☐ Pump ☐ Bailer ☒ Air ☐ Flowing Artesian

Yield gal/min	Drawdown	Drill stem at	Time
650+		660	1hr.
275-280		200	1hr.

Temperature of water 57°F Depth Artesian Flow Found
Was a water analysis done? ☒ Yes By whom A.M.J.
Did any strata contain water not suitable for intended use? ☐ Too little
☐ Salty ☐ Muddy ☐ Odor ☐ Colored ☐ Other
Depth of strata:

County Washington
Tax Lot 402 Lot
Township 2N N or S Range 3W E or W WM
Section 31 NE 1/4 NW 1/4
Lat ° ' " or . (degrees or decimal)
Long ° ' " or . (degrees or decimal)
Street Address of Well (or nearest address)
42000 NW Banks Rd. Banks, Or

(10) STATIC WATER LEVEL
48 ft. below land surface. Date 5-25-05
ft. below land surface. Date
Artesian pressure lb. per square inch Date

(11) WATER BEARING ZONES
Depth at which water was first found 378

From	To	Estimated Flow Rate	SWL
378	468	350 gpm	48
615	660	300 gpm	48

(12) WELL LOG Ground Elevation

Material	From	To	SWL
Brn & red-brn cly sticky, firm.	0	69	
Red-brn basalt, very weathered.	69	102	
Green clay soft	102	121	
Gry-brn clay firm	121	155	
Red-brn basalt very weathered.	155	179	
Brn basalt, weathered	179	201	
Gry-brn basalt	201	206	
Gry/gry-blk basalthrd	206	231	
Gry-brn basalt w/ interbeds.	231	251	
Gry-gry blk basalt hrd	251	313	
Brn basalt interbed	313	325	

Date Started 3-22-05 Completed 5-25-05

(unbonded) Water Well Constructor Certification
I certify that the work I performed on the construction, deepening, alteration, or abandonment of this well is in compliance with Oregon water supply well construction standards. Materials used and information reported above are true to the best of my knowledge and belief.

WWC Number 573 Date 5-31-2005
Signed

(bonded) Water Well Constructor Certification
I accept responsibility for the construction, deepening, alteration, or abandonment work performed on this well during the construction dates reported above. All work performed during this time is in compliance with Oregon water supply well construction standards. This report is true to the best of my knowledge and belief.

WWC Number 1266 Date May 31, 2005
Signed

ORIGINAL – WATER RESOURCES DEPARTMENT FIRST COPY – CONSTRUCTOR SECOND COPY – CUSTOMER 06/16/2004

(1) LAND OWNER Well Number

Name City of Banks Conti. Page 2

Address 100 South Main Street

City Banks State OR Zip 97106

(2) TYPE OF WORK ☒ New Well

☐ Deepening ☐ Alteration (repair/recondition) ☐ Abandonment ☐ Conversion

(3) DRILL METHOD

☒ Rotary Air ☒ Rotary Mud ☐ Cable ☐ Auger ☐ Cable Mud

☐ Other

(4) PROPOSED USE

☐ Domestic ☒ Community ☐ Industrial ☐ Irrigation

☐ Thermal ☐ Injection ☐ Livestock ☐ Other

(5) BORE HOLE CONSTRUCTION Special Construction: ☐ Yes ☒ No

Depth of Completed Well 665 ft.

Explosives used: ☐ Yes ☒ No Type Amount

BORE HOLE Diameter	From	To	SEAL Material	From	To	Sacks or Pounds

How was seal placed: Method ☐ A ☐ B ☐ C ☐ D ☐ E

☐ Other

Backfill placed from ft. to ft. Material

Gravel placed from ft. to ft. Size of gravel

(6) CASING/LINER

	Diameter	From	To	Gauge	Steel	Plastic	Welded	Threaded
Casing:					☐	☐	☐	☐
					☐	☐	☐	☐
					☐	☐	☐	☐
					☐	☐	☐	☐
Liner:					☐	☐	☐	☐
					☐	☐	☐	☐

Drive Shoe used ☐ Inside ☐ Outside ☐ None

Final location of shoe(s)

(7) PERFORATIONS/SCREENS

☐ Perforations Method

☐ Screens Type Material

From	To	Slot Size	Number	Diameter	Tele/pipe size	Casing	Liner
						☐	☐
						☐	☐
						☐	☐
						☐	☐
						☐	☐

(8) WELL TESTS: Minimum testing time is 1 hour

☐ Pump ☐ Bailer ☐ Air ☐ Flowing Artesian

Yield gal/min	Drawdown	Drill stem at	Time

Temperature of water Depth Artesian Flow Found

Was a water analysis done? ☐ Yes By whom

Did any strata contain water not suitable for intended use? ☐ Too little

☐ Salty ☐ Muddy ☐ Odor ☐ Colored ☐ Other

Depth of strata:

(9) LOCATION OF WELL (legal description)

County Washington

Tax Lot 402 Lot

Township 2N N or S Range 3W E or W WM

Section 31 NE 1/4 NW 1/4

Lat ___°___'___" or _____ (degrees or decimal)

Long ___°___'___" or _____ (degrees or decimal)

Street Address of Well (or nearest address) 42000 NW Banks Rd., Banks, OR

(10) STATIC WATER LEVEL

48 ft. below land surface. Date 05/25/2005

ft. below land surface. Date

Artesian pressure lb. per square inch Date

(11) WATER BEARING ZONES

Depth at which water was first found

From	To	Estimated Flow Rate	SWL

(12) WELL LOG Ground Elevation

Material	From	To	SWL
Blk basalt,fracs,occ soapstone.	325	378	
Brn/gry-brn basalt frac broken occ red-brn basalt/lava streaks	378	420	48
Blk/gry blk basalt/lava	420	468	
Blk/gry blk basalt, hard occ fracs.	468	615	
Blk basalt interbed, occ claystone occ lava streaks.	615	660	48
Blk/gry-blk basalt, fracs.	660	665	

Date Started 3-22-2005 Completed 5-25-2005

(unbonded) Water Well Constructor Certification

I certify that the work I performed on the construction, deepening, alteration, or abandonment of this well is in compliance with Oregon water supply well construction standards. Materials used and information reported above are true to the best of my knowledge and belief.

WWC Number 573 Date 5-31-2005

Signed

(bonded) Water Well Constructor Certification

I accept responsibility for the construction, deepening, alteration, or abandonment work performed on this well during the construction dates reported above. All work performed during this time is in compliance with Oregon water supply well construction standards. This report is true to the best of my knowledge and belief.

WWC Number 1266 Date May 31, 2005

Signed

ORIGINAL – WATER RESOURCES DEPARTMENT FIRST COPY – CONSTRUCTOR SECOND COPY – CUSTOMER 06/16/2004

RECEIVED

MAR 29 2021

Oregon
Tina Kotek, Governor

Water Resources Department
North Mall Office Building
725 Summer St NE, Suite A
Salem, OR 97301
Phone 503 986-0900
Fax 503 986-0904
www.oregon.gov/owrd

March 14, 2023

CITY OF BANKS
ATTENTION: JOLYNN BECKER, CITY MANAGER
13680 NW MAIN STREET
BANKS OR 97106

RE: Refund for Reimbursement Authority Contract R12827-23; Application G-8476

Dear Applicant/Agent,

Thank you for using the Certificate Reimbursement Authority Program to expedite the processing of your client's Claim of Beneficial Use. Based on a request to withdraw the Claim of Beneficial Use (Claim), the Department is refunding unspent monies. A check will be mailed separately to you.

I hope you were pleased with the Certificate Reimbursement Authority Program and would consider using it again if the need arises. If you have any questions about this refund, please send an email to Kerry.L.Kavanagh@water.oregon.gov or call me at (503) 979-3208.

Sincerely,

K Kavanagh

Kerry Kavanagh
Reimbursement Authority, Certificates
Water Right Service Division

cc: File G-8476

WATER RESOURCES DEPARTMENT

REQUEST FOR DISTRIBUTION OF FUNDS

TO: **Fiscal Services Section** DATE: March 14, 2023

FROM: Kerry Kavanagh
Phone: (503) 986-0927

SUBJECT: **REIMBURSEMENT AUTHORITY - Request for Refund**

FILE #: G-8476 **RA #:** R12827-23 **RECEIPT #:** 136671

Please prepare payment in the amount of **$894.00**, made payable to:

47126
0413

Name: **CITY OF BANKS**

Address: **13680 NW MAIN STREET**
BANKS OR 97106

These funds are being paid or refunded as a result of (check one):

_____ Excess fees were collected for Claim of Beneficial Use
_____ Excess fees were collected for Reimbursement Authority
__X__ Other – withdrew COBU – fees collected for Reimbursement Authority

I have reviewed this distribution request and have determined the request to be justified as to the purpose indicated above. Fiscal Services is hereby authorized to process the requested distribution.

Authorized Signature: Dwight Hark Date: 3-16-23

REIMBURSEMENT AUTHORITY PERMIT
APPLICATION G-8476 PERMIT G-7593

COBU WITHDRAWN 2-11-2022

KAVANAGH Kerry L * WRD

From: Bob Long <Bob.Long@cwmh2o.com>
Sent: Friday, February 11, 2022 8:33 AM
To: KAVANAGH Kerry L * WRD
Subject: RE: NEED: demonstration of use for municipal use - Certificate RA Project R12827-23 for City of Banks involving Application G-8476

Kerry-

The City would like to withdraw the Claim of Beneficial Use at this time. Thank you. - B

Bob Long, RG, LHG, CWRE | Principal Consultant
www.CwMH2O.com | Cell (503) 799-0304

From: KAVANAGH Kerry L * WRD <Kerry.L.KAVANAGH@water.oregon.gov>
Sent: Friday, February 4, 2022 1:09 PM
To: Bob Long <Bob.Long@cwmh2o.com>
Cc: KAVANAGH Kerry L * WRD <Kerry.L.KAVANAGH@water.oregon.gov>
Subject: NEED: demonstration of use for municipal use - Certificate RA Project R12827-23 for City of Banks involving Application G-8476

Hello Bob,

During our telephone conference on January 20, 2022, I believe that you had mentioned you would be meeting with City officials on or about January 27, 2022.

I am following up on the demonstration of beneficial use. Any new information to share?

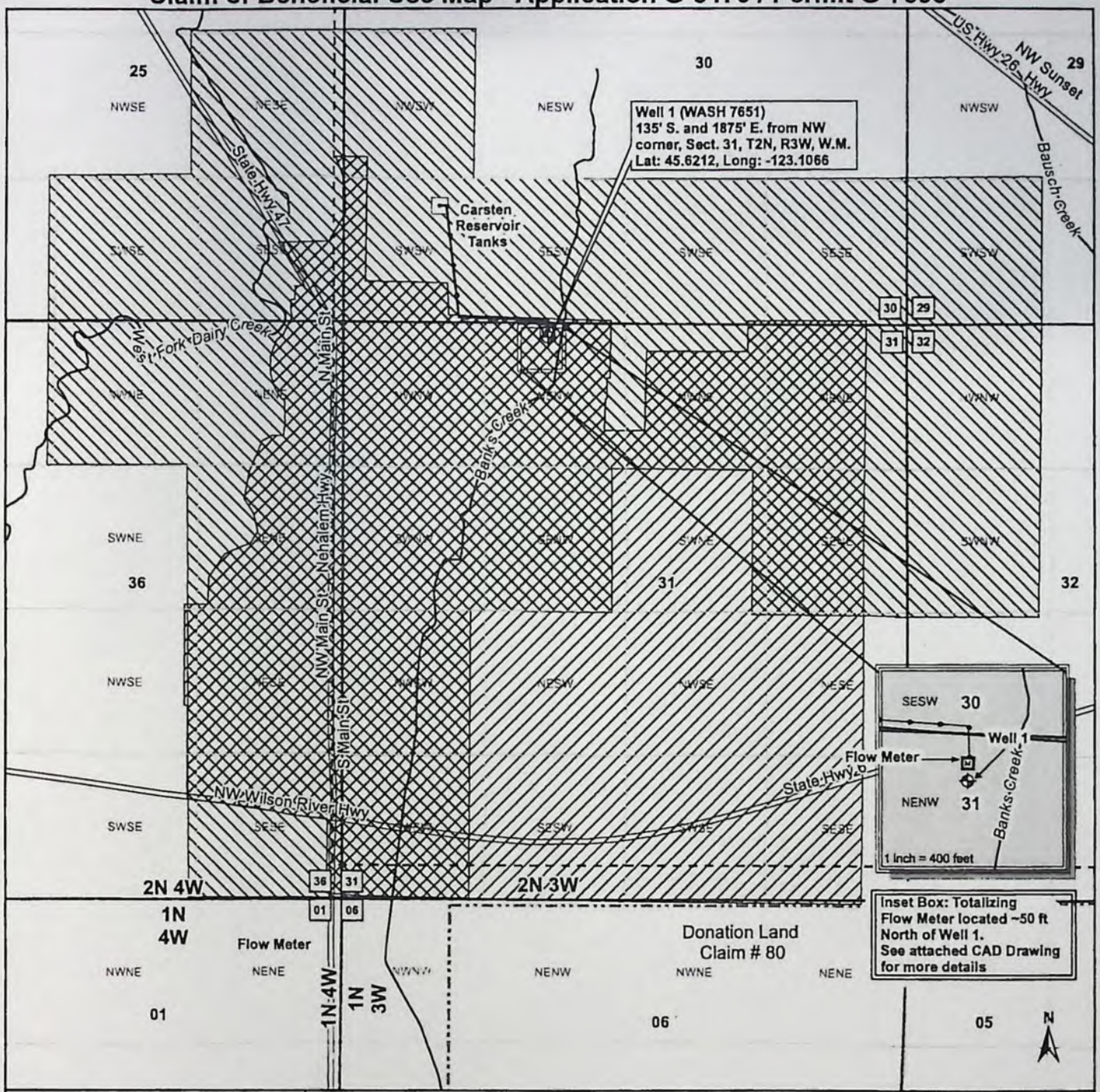
Thank you,
Kerry

Kerry Kavanagh
Certificate Reimbursement Authority Program Coordinator
Certificate Section, Water Rights Services Division
725 Summer St NE Suite A | Salem OR 97301 | Direct 503.979.3208
kerry.l.kavanagh@water.oregon.gov| https://www.oregon.gov/OWRD

OREGON WATER RESOURCES DEPARTMENT

Integrity | Service | Technical Excellence | Teamwork | Forward-Looking

Claim of Beneficial Use Map - Application G-8476 / Permit G-7593



City of Banks
Well 1 (WASH 7651)
Application; G-8476
Permit: G-7593

T. 2N., R. 3W. W.M. Sect. 29, 30, 31, 32
T. 2N., R. 4W. W.M. Sect. 25 and 36

Legend

- Well 1 (WASH 7651)
- Magnetic Flow Meter in Vault
- Carsten Reservoir Tanks
- Water line (6" pvc)
- Streams
- Highways
- Place of Use per Permit 7593
- Banks Service Area per UGB
- Donation Land Claim
- Township/Range
- 31 Sections
- NENW 1/4, 1/4 Sections

BANKS

13680 NW Main Street
Banks, Oregon 97106

CWRE SEAL:

RECEIVED
SEP 13 2021
OWRD

CwM-H2O
Complete Water Management

1319 SE MLK JR BLVD #204
Portland, OR 97214

0 660 1,320 FT

1 inch = 1,320 ft

This map is not intended to provide legal dimensions or property ownership lines.

C:\01 Projects\1501004 Water Supply Development\6. Applications\CBU\Well 1\Banks_CBU_WASH7651_17Mar2020.pdf JST

CITY OF BANKS

CERT – full extent

Completion Checklist for Claims of Beneficial Use for
POST JULY 1, 2004 Claims

Application # G-8476 / Permit G-7593	WRD Reviewer Kerry Kammerer
Transfer # Permit Amend T-10055	Claim Logged
Date Received 9-13-2021	Oversized Map # N/A
CWRE Name Bob Long	

Map Review: JOlynn Becker, City Manager — Permit G-7593 issued 12-2-1978. A Date = 12-2-1978. B Date = 10-1-1979 C Date = 10-1-1980 extended to 10-1-2027. Permit Amendment T-10055 issued

- ✓ Map on polyester film (OAR 690-014-0170(1) & 310-0050(1)(b))
- ✓ Application & permit #; or transfer # (OAR 690-014-0100(1))
- ✓ Disclaimer (OAR 690-014-0170(5))
- ✓ North arrow (OAR 690-310-0050(2)(c))
- ✓ CWRE stamp and signature (OAR 690-014 & 310-0050)
- ✓ Appropriate scale (1" = 1320', 1" = 400', or the original full-size scale of the county assessor map) (014 & 310)
- ✓ Township, range, section, and tax lot numbers (OAR 690-310-0050(4))
- MA Source illustrated if surface water (OAR 690-014-0170(3)) gw
- ✓ Point(s) of diversion or appropriation (illustrated) (OAR 690–014(4) & 690-310-0050)
- ✓ Point(s) of diversion or appropriation (coordinates)(OAR 690–014(4) & 690-310-0050)
- ✓ Conveyance structures illustrated (pump, pipelines, ditches, etc.) (OAR 690-310-0050)
- ✓ Description of the location, in relation to the point of diversion or appropriation, of any fish screens, by-pass devices, and measuring devices required (OAR 690–014-0170(4))
- ✓ Place of use (1/4 1/4, or projected 1/4 1/4 lines within DLCs, or Gov Lots; if irrigation, # of acres in each subdivision; if for domestic or human consumption, location of dwelling or spigot) (OAR 690-310-0050, 690-014, 690-380-6010)

COBU – Well 1 (Behrman Well) WASH 7651 – 300 gpm (~0.67 cfs)

Report Review:

- ✓ On form or format provided by the Department (OAR 690-014-0100(1))
- ✓ Application & permit #; or transfer # (OAR 690-014)
- ✓ Ownership information (OAR 690-014)
- ✓ Date of survey (OAR 690-014)
- ✓ Person interviewed (OAR 690-014)
- ✓ County (OAR 690-014) WASHINGTON
- ✓ Description of conveyances system (from POD to POU) (OAR 690-014-0100)
- ✓ Source(s) of water (OAR 690-014-0100)
- ✓ Place of use location (OAR 690-014-0100)
- ✓ Type of use (OAR 690-014-0100)
- ✓ Extent of use (OAR 690-014-0100)
- ✓ Rate and Duty (OAR 690-014-0100)
- ✓ Diversion rate for each use (OAR 690-014-0100)
- ✓ Diversion works description (pump make, serial model, capacity, and description) (OAR 690-014-0100)
- ✓ System capacity (OAR 690-014-0100)
  - ✓ Calculated capacity of system (required)
  - Measured amount of use (optional)
- Permit/Transfer Final Order Conditions (OAR 690-014-0100)
  - Time limits
  - MA Initial water level measurements
  - MA Annual static water level measurements
  - Measurement, recording, and reporting
    - ✓ Meter/measuring device
    - ✓ Water use reporting per WRIS – Water Years 1988 – 2021.
  - MA Fish screening and/or by-pass per WRIS – Pump Test Exception requested 3-29-2021
  - Pump test (ground water)
  - Other "4 in 8"
    - → check w/ Kami Cope
    -
- ✓ Conditions from Extension Final Order and/or Water Management Conservation Plan
  - FO extended C Date to 10-1-2027
  - ↳ WMCP must be approved – or limited to 0.613 cfs.
- ✓ CWRE stamp and signature (OAR 690-014-0100)
- ✓ Signature(s) of permittee of transfer holder (OAR 690-014-0100)

DEF = deficient
N/A = Not Applicable

Application # G-8476 Permit # G-7593 Transfer #

City of Banks 23

Reimbursement Authority Process
Itemized FINAL Sheet
for
Certificates

	New Est. Time (hr)	Multiplier	Est Hours	Individual	New Hourly Rate	New Est. Cost	Date/Act. Time
1. Review Claim of Beneficial Use report & map	3.00	31%	3.93	Kerry	$70.20	$ 275.89	
2. Conflict Check	0.00	31%	0.00	Kerry	$70.20	$ -	
3. Prep of def. letter - contigency time	0.00	31%	0.00	Kerry	$70.20	$ -	
4. Enter pump test data -	0.00	31%	0.00	Kerry	$70.20	$ -	
5. 1 cert - 0.67 cfs for MU	2.00	31%	2.62	Kerry	$70.20	$ 183.92	
6a. Peer review - consultation	0.75		0.75	Gerry	$66.68	$ 50.01	
6b. Peer review	0.00		0.00	Dwight	$98.90	$ -	
6c. Peer review	0.00	26%	0.00	Gerry	$66.68	$ -	
7. Project Management - Bob Long, CWRE	4.75	31%	6.22	Kerry	$70.20	$ 436.82	
8a. Water right data record update	0.00	31%	0.00	Support-Tonya	$33.45	$ -	
8b. Water right data record update	0.00		0.00	Data Tech	$47.94	$ -	
9. Pump Test - 2/8/2022 Ben approved exemption	1.00		1.00	Ben Scandella	$59.26	$ 59.26	
Total	**11.50**		**14.52**		Sub Total	**$1,006**	
					10% Overhead	$100.59	
					TOTAL	**$1,106**	

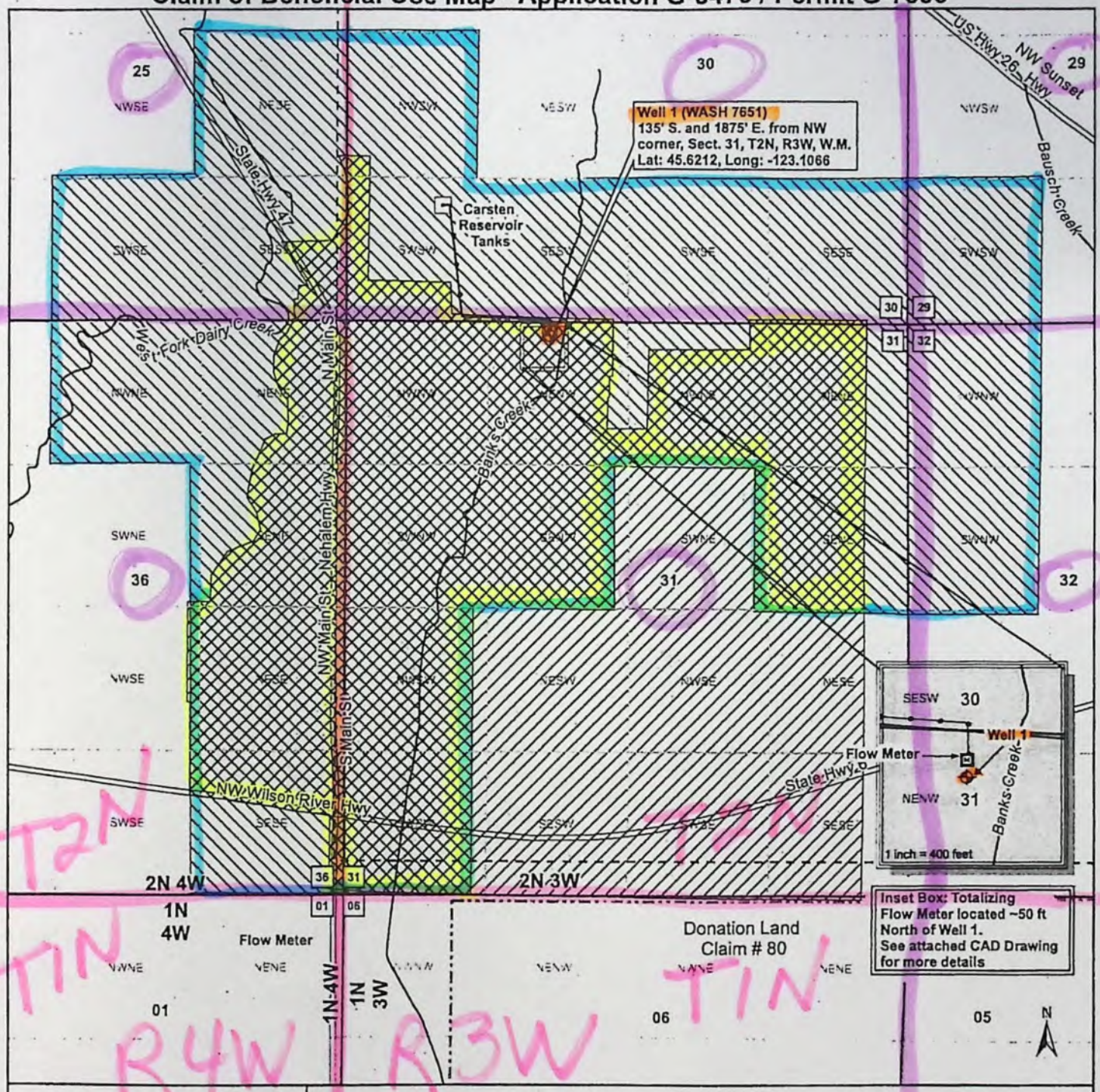
2/14/2022 COBU withdrawn by City of Banks - unable to demonstrate beneficial use to Department's satisfaction

Refund of $ 894 (estimated cost = $2000)

Permit G-7593 issued 12-2-1978. A Date = 12-2-1993. B Date = 12-2-1979. C Date = 10-1-1980 extended to 10-1-2027.

-- COBU received 9-13-2021 from Bob Long = CWRE.

Claim of Beneficial Use Map - Application G-8476 / Permit G-7593



City of Banks
Well 1 (WASH 7651)
Application; G-8476
Permit: G-7593

T. 2N., R. 3W. W.M. Sect. 29, 30, 31, 32
T. 2N., R. 4W. W.M. Sect. 25 and 36

Legend

- Well 1 (WASH 7651)
- Magnetic Flow Meter in Vault
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- Streams
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BANKS
13680 NW Main Street
Banks, Oregon 97106

CWRE SEAL:

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1319 SE MLK JR BLVD #204
Portland, OR 97214

0 660 1,320 FT

1 Inch = 1,320 ft

This map is not intended to provide legal dimensions or property ownership lines.

C:\01 Projects\1501004 Water Supply Development\6. Applications\CBU\Well 1\Banks_CBU_WASH7651_17Mar2020.pdf JST

Oregon Water Resources Department
Groundwater Information System

Groundwater Site: WASH 7651

Main Help
Return Contact Us

Site Identification (Click to Collapse...)

GW LogID: WASH 7651 Well Log Database
GW Well Tag Number:
Tag Verified on Well: No
Site Type: WELL
Primary Use:
Unused Status:
Site Source Organization:
Site Source OWRD:
Established By: JOSH HACKETT
Established Date: 01/12/2011
Bonded Company:
Stage: COMPLETE

Location (Click to Collapse...)

Latitude/Longitude
Latitude: 45.62123492 Horiz. Error: 50.00 ft.
Longitude: -123.10666085 Datum: WGS1984
Lat/Long Source: WR GR TRAN MAP

Location
TRSQQ: WM 2.00N3 00W31NENW
Tax Map: 02N-03W-31
Taxlot: 402
24 Quad: FOREST GROVE
Basin: 2 - Willamette
County: Washington
WM District: 18
WM Region: NW
LSD Elev: 230.00 Accy: 5.00 Datum: NGVD1929
Elev Source: 7.5-MINUTE MAP
Groundwater Mapping Tool

Water Rights (Click to Expand...)

Well Construction History (Click to Collapse...)

Well Construction History

Well Log Id	Well Log	Work Type	Startcard	Well Tag	Owner Name	First Water	Max Case. Diam.	Max Case. Depth.	Max Seal Depth.	Max Depth	Completed Depth	Complete Date
WASH 7651	Log	NEW			CITY OF BANKS	130.00	8	210.00	210.00	450.00	450.00	8/24/1977

Well Log	Aquifer	Aq at Max Depth	System Aquifer	Regional USGS Aquifer	Local USGS Aquifer
WASH 7651	Columbia River Basalt	Late Tertiary Basalt Aq	Late Tertiary Basalt Aquifers		Columbia River Basalt Group

Well Test

No data matches search criteria.

Lithology (Click to Expand...)

Well Construction (Click to Expand...)

Measured Water Level (Click to Collapse...)

Records/Page: 20 Find

Measured Water Level

Date	Time	Water Level (BLSD)	WL Elev (ft AMSL)	Organization	QWRD	Method	Status	MP Height
3/3/2020		106.00	124.00	PUMP INSTALLER	PERMIT CONDITION PROGRAM	TRANSDUCER	STATIC	
2/28/2019		96.00	134.00	PUMP INSTALLER	PERMIT CONDITION PROGRAM	TRANSDUCER	STATIC	
7/2/2018	12:51:00	78.00	152.00	OWNER	GWATER	TRANSDUCER	STATIC	
6/9/2018	23:45:00	81.00	149.00	OWNER	GWATER	TRANSDUCER	STATIC	
5/4/2018	17:18:00	63.00	167.00	OWNER	GWATER	TRANSDUCER	STATIC	
4/21/2018	10:05:00	58.00	172.00	OWNER	GWATER	REPORTED	STATIC	
3/8/2018		80.00	150.00	PUMP INSTALLER	PERMIT CONDITION PROGRAM	TRANSDUCER	STATIC	0.00
3/7/2018	11:28:00	50.00	160.00	OWNER	GWATER	REPORTED	STATIC	
1/21/2018	20:15:00	54.00	176.00	OWNER	GWATER	REPORTED	STATIC	
12/17/2017	15:18:00	60.00	170.00	OWNER	GWATER	TRANSDUCER	STATIC	
11/7/2017	08:14:00	64.00	166.00	OWNER	GWATER	TRANSDUCER	STATIC	
10/4/2017	07:05:00	72.00	158.00	OWNER	GWATER	TRANSDUCER	STATIC	
9/14/2017	10:30:00	102.00	128.00	OWNER	GWATER	TRANSDUCER	STATIC	
8/30/2017	09:28:00	125.00	105.00	OWNER	GWATER	TRANSDUCER	STATIC	
7/2/2017	18:52:00	91.00	139.00	OWNER	GWATER	TRANSDUCER	STATIC	
4/5/2017				PUMP INSTALLER	PERMIT CONDITION PROGRAM	TRANSDUCER	STATIC	0.00
3/16/2016		56.00	174.00	PUMP INSTALLER	PERMIT CONDITION PROGRAM	OTHER	STATIC	0.00
3/18/2014		89.75	140.25	CWRE	PERMIT CONDITION PROGRAM	ETAPE	STATIC	
8/24/1977		34.00	196.00	DRILLER	WELL LOG	REPORTED	UNKNOWN	

Available Data (Click to Expand...)

Other Documents/Images (Click to Expand...)

View Hydrograph

Application No. G-8476 Permit No. G 7593

STATE OF OREGON WATER RESOURCES DEPARTMENT

Application for a Permit to Appropriate Ground Water

RECEIVED
SEP 20 1977
WATER RESOURCES DEPT
SALEM, OREGON

I, City of Banks, Oregon (Name of Applicant)

of City Hall (Mailing Address), Banks (City),

State of Oregon, 97106 (Zip Code) Phone No. Mayor Howard Steinbach 324-2251 Robert Prickett, City Recorder 324-8462 do hereby make application for a permit to appropriate the following described ground waters of the State of Oregon:

1. The development will consist of one well (Give number of wells, tile lines, infiltration galleries, etc.) having a diameter of 8 inches and an estimated depth of 450 feet.

2. The well or other source is to be located 135 ft. S (N. or S.) and 560 ft. W (E. or W.) from the ¼ corner of X on the north line of Section 31, T2N, R3W, W.M. (Public Land Survey Corner)

(If there is more than one well, each must be described)

being within the NE ¼ of the NW ¼ of Sec. 31 Tp. 2N R. 3W, W. M., in the county of Washington.

3. Location of area to be irrigated, or place of use if use other than irrigation.

Township	Range	Section	List ¼ ¼ of Section	List use and/or number of acres to be irrigated
SEE ATTACHED	SHEET #1			

4. It is estimated that 210 feet of the well will require 8 5/8" diameter welded steel (Kind) casing.

5. Depth to water table is estimated ..... (Feet) Well drilled by A.M. Jannsen Drilling Co., Aloha, Oregon

Form 690-3-0-1-77

6. *The amount of water which the applicant intends to apply to beneficial use is ..... cubic feet per second or* ....300..... *gallons per minute.*

7. *The use to which the water is to be applied is* ..municipal.....

.....

8. *If the flow to be utilized is artesian, the works to be used for the control and conservation of the supply when not in use must be described.*

(not artesian)

9. *If the location of the well, or other development work is less than one-fourth mile from a natural stream channel, give the distance to the channel and the difference in elevation between the stream bed and the ground surface at the source of development.*

Natural stream channel (intermittent flow) 130 feet due east of well. Well is 10 feet higher than streambed.

10. *DESCRIPTION OF WORKS*

Include length and dimensions of supply ditch or pipeline, size and type of pump and motor, type of irrigation system to adequately describe the proposed distribution system.

Water will be conveyed from well to existing city reservoir (as shown on attached map) through an 8-inch pipeline.

The proposed well pump will be a 40 H.P., 14 stage deep well turbine capable of delivering 300 gallons per minute to a 400 ft. T.D.H.

11. *Construction work will begin on or before* Well construction - August 16, 1977; Pump & pipeline - January, 1978

12. *Construction work will be completed on or before* Well construction - August 24, 1977; Pump & pipeline - June, 1978

13. *The water will be completely applied to the proposed use on or before* July, 1978

14. *If the ground water supply is supplemental to an existing supply, identify the supply and existing water right.* See attached map showing existing water supply system. Water right certificate no. 5353.

Application No. 6-8476 *Permit No.* G 7593

SHEET #1

3. Location of area to be irrigated, or place of use if use other than irrigation.

Township	Range	Section	List ¼ ¼ of Section
T2N	R3W	29	SW¼ SW¼
T2N	R3W	30	NW¼ SW¼
			SW¼ SW¼
			SE¼ SW¼
			SW¼ SE¼
			SE¼ SE¼
T2N	R3W	31	NW¼ NW¼
			NE¼ NW¼
			NW¼ NE¼
			NE¼ NE¼
			SE¼ NE¼
			SE¼ NW¼
			SW¼ NW¼
			NW¼ SW¼
			SW¼ SW¼
T2N	R3W	32	NW¼ NW¼
			SW¼ NW¼
T2N	R4W	25	NE¼ SE¼
			SE¼ SE¼
			SW¼ SE¼
T2N	R4W	36	NW¼ NE¼
			NE¼ NE¼
			SE¼ NE¼
			NE¼ SE¼
			SE¼ SE¼

Application No. G-8176
Permit No. G 7593

SHEET #2

REMARKS:

The City of Banks presently obtains it's water supply from springs about 4 miles north of the City (see Water Right Certificate No. 5353 and attached map). The present supply is not sufficient to meet summer-time needs; therefore a new well was constructed. At present, Banks supplys water to 747 persons and in year 2000 it is estimated that 1,971 persons will be served. Average day water requirements are presently 104,500 G.P.D. and in year 2000 it is estimated to be 276,000 G.P.D.

Requirements of the average day of the maximum month are presently 200,000 G.P.D. and in year 2000 it is estimated to be 524,000 G.P.D. The present supply (springs) can provide 173,000 G.P.D. and the proposed well can supply 432,000 G.P.D. for a total of 605,000 G.P.D. which will meet the estimated needs in year 2000.

Application No. 6-8476
Permit No.

Remarks: SEE ATTACHED SHEET #2

Howard D. Steinbock Mayor
Signature of Applicant
City of Banks, Banks, Or.

This is to certify that I have examined the foregoing application, together with the accompanying maps and data, and return the same for

In order to retain its priority, this application must be returned to the Water Resources Director with corrections on or before , 19

WITNESS my hand this day of , 19

Water Resources Director

By

This instrument was first received in the office of the Water Resources Director at Salem, Oregon, on the 29TH *day of* SEPTEMBER, 19 77, *at* 8:00 *o'clock* A *M.*

Application No. G-8476 *Permit No.* G 7593

Application No. G-8476 Permit No. G 7593

Permit to Appropriate the Public Waters of the State of Oregon

This is to certify that I have examined the foregoing application and do hereby grant the same, SUBJECT TO EXISTING RIGHTS INCLUDING THE EXISTING MINIMUM FLOW POLICIES ESTABLISHED BY THE WATER POLICY REVIEW BOARD and the following limitations and conditions:

The right herein granted is limited to the amount of water which can be applied to beneficial use and shall not exceed 0.67 *cubic feet per second measured at the point of diversion from the well or source of appropriation, or its equivalent in case of rotation with other water users, from* a well

The use to which this water is to be applied is municipal.

If for irrigation, this appropriation shall be limited to ..... of one cubic foot per second or its equivalent for each acre irrigated and shall be further limited to a diversion of not to exceed ..... acre feet per acre for each acre irrigated during the irrigation season of each year;

and shall be subject to such reasonable rotation system as may be ordered by the proper state officer.

The well shall be constructed in accordance with the General Standards for the Construction and Maintenance of Water Wells in Oregon.

The works constructed shall include an air line and pressure gauge or an access port for measuring line, adequate to determine water level elevation in the well at all times.

The permittee shall install and maintain a weir, meter, or other suitable measuring device, and shall keep a complete record of the amount of ground water withdrawn.

The priority date of this permit is September 29, 1977

Actual construction work shall begin on or before December 2, 1978 *and shall thereafter be prosecuted with reasonable diligence and be completed on or before October 1, 19*79

*Complete application of the water to the proposed use shall be made on or before October 1, 19*80

WITNESS my hand this 2nd *day of* December, *19*77

James E. Sexton

Water Resources Director

Application No. G 8014
Permit No. G 7593

NORTH

EXISTING RESERVOIR 0.2 MG.

PROPOSED PIPELINE 10"

EXISTING 10" PIPELINE TO CITY

BANKS ROAD

160'

POINT OF DIVERSION

AERTS RD.

NEHLEN

WASHINGTON AVE.

PACIFIC AVE.

ROSE AVE.

WILKESBORO ROAD

HIGHWAY

BURLINGTON NORTHERN R.R.

SOUTHERN PACIFIC R.R.

BANKS CITY LIMITS

WOODMEN AVE.

SUNSET AVE.

DEPOT ST.

MARKET ST.

PARK ST.

WILKES ST.

MAIN ST.

HWY 47.

SELLERS RD.

STATE HIGHWAY 47

CEDAR CANYON ROAD

WILSON RIVER

T2N WM

T1N WM

R4W WM

R3W WM

NOTE:
SHADED AREA IS THE CITY OF BANKS SERVICE AREA

DESIGNED	APPROVED	
DRAWN JGN	SCALE 1"=400'	DATE 9-26-77
CHECKED	FILE 702-8	

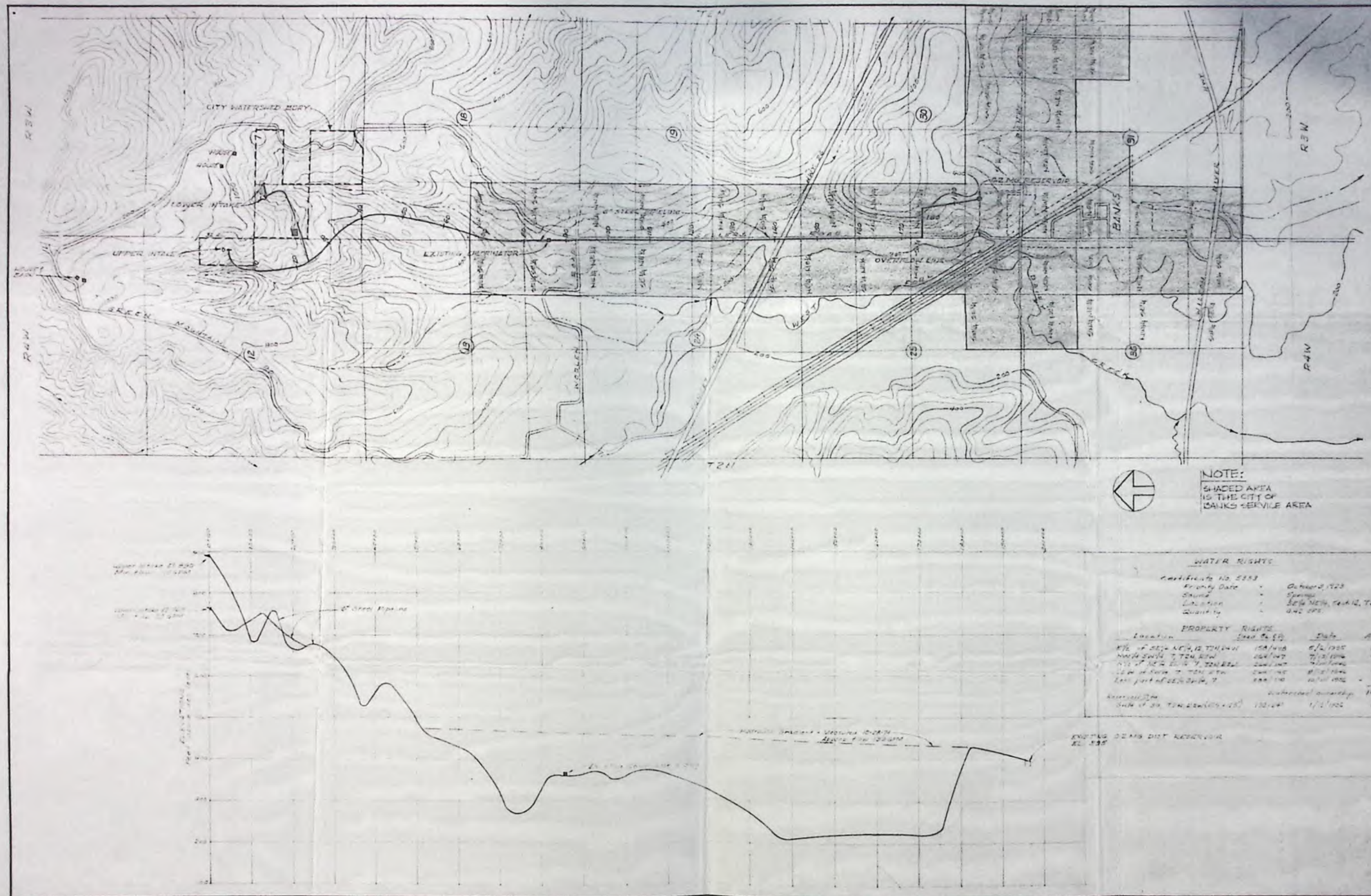
DATE | NO. | REVISION | BY

KLEIN CONSULTING ENGINEERS
CIVIL ENGINEERS · PLANNERS
FOREST GROVE, OREGON

WATER RIGHT MAP
TO ACCOMPANY AN APPLICATION FOR
CITY OF BANKS, OREGON
IN SECTIONS 29, 30, 31 & 32, T2N, R3W, WM. AND
SECTIONS 25 & 36, T2N, R4W, WM.
WASHINGTON COUNTY, OREGON

SHEET

Application No. G 8116
Permit No. G 7593



RECEIVED

DATE	NO.	REVISION	BY

DESIGNED
DRAWN
CHECKED
APPROVED
SCALE 1"=100' 1"=10'
DATE 9-27-1974
FILE

KLEIN CONSULTING ENGINEERS
CIVIL ENGINEERS · PLANNERS
FOREST GROVE, OREGON

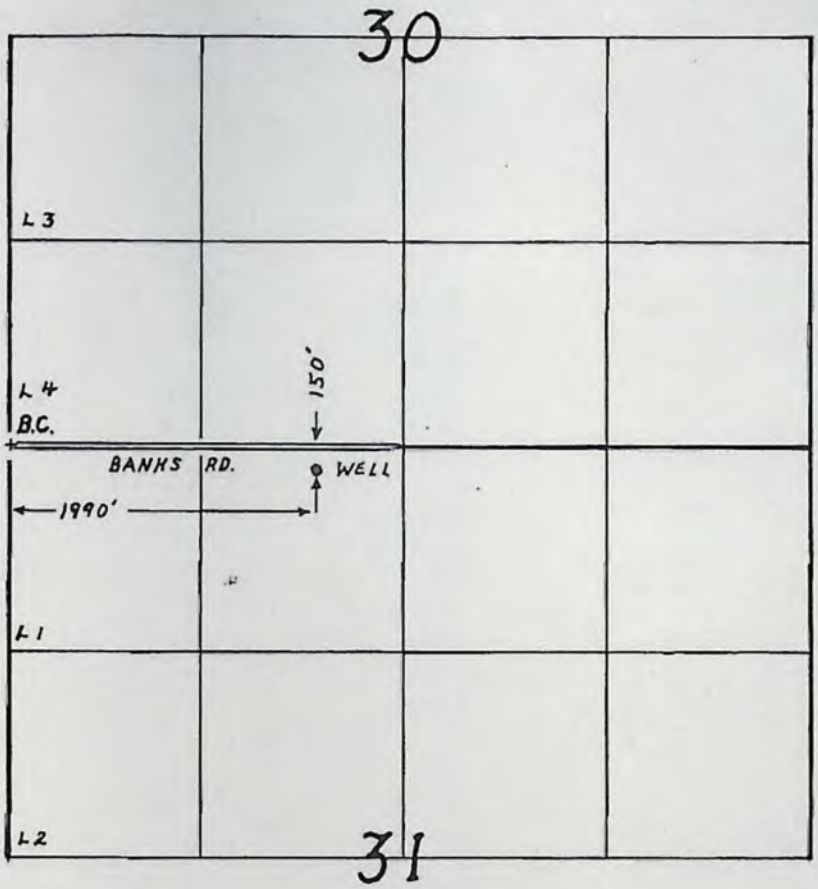
CITY OF BANKS, ORE.
WATER SUPPLY DEVELOPMENT

PLAN AND PROFILE
WATER SUPPLY SYSTEM

SHEET

CHICAGO ARCHITECTURAL & ENGINEERING SUPPLIES CO.

T. 2 N., R. 3 W., W.M.



1"= 1320'

FINAL PROOF SURVEY

UNDER

Application No. G-8476 Permit No. G-7593

IN NAME OF

CITY OF BANKS

Surveyed JULY 14, 1993, by R.W. Klassen

OREGON WATER RESOURCES DEPARTMENT

OREGON WATER RESOURCES DEPARTMENT

CERTIFICATE REIMBURSEMENT AUTHORITY APPLICANT'S AGREEMENT

Contract Number: **R12827-23**

This Agreement is between the **Oregon Water Resources Department**, hereafter OWRD, and **City of Banks,** hereafter Applicant, hereafter known together as the parties.

OWRD Information	**Applicant's Information**	**Applicant's Representative**
Project Contact: Kerry Kavanagh	Name: Jolyn Becker	Name: Bob Long
Reimbursement Authority	Title: City Manager	Title: Representative
Oregon Water Resources Department	Company: City of Banks	Company: CwM-H2O
725 Summer Street NE	Address: 13680 NW Main Street	Address: 1319 SE MLK Jr Blvd, Suite 204
Salem, OR 97301-1271	Banks, OR 97106	Portland, OR 97214
Phone: 503-979-3208	Phone: 503-254-5112	Phone: 503-954-1326
Email: Kerry.L.Kavanagh@oregon.gov	Email*: jbecker@cityofbanks.org	Email*: Bob.Long@cwmh2o.com

*By providing an Email address, consent is given to receive all correspondence electronically. (Paper copies of the certificate and final order documents will also be mailed.)

1. **Purpose.** The purpose of this Agreement is to expedite the processing of the **Claim of Beneficial Use. (Application Number: G-8476)**

2. **Authority.** ORS 536.055 authorizes the OWRD to enter into a voluntary agreement with any applicant, permittee or regulated entity (collectively Applicant) for expediting or enhancing a regulatory process. In making this agreement, OWRD shall require the applicant to pay the full cost of expedited process.

3. **Restrictions.** City of Banks and OWRD agree that this Agreement shall not be construed to restrict in any way the decisions and actions by OWRD. OWRD shall be free to exercise independent judgment consistent with existing laws and regulations.

4. **Effective Date and Duration.** Unless otherwise terminated by non-deposit of funds by the Applicant, this Agreement shall become effective on the date on which both parties have signed the Agreement and the full deposit of the estimated cost of the proposed service has been received by OWRD.

5. **Consideration.** City of Banks shall pay OWRD in advance for actual costs incurred by OWRD. City of Banks agrees to pay the full amount of **$2000** to OWRD prior to commencement of any work stated in this Agreement. This payment will be placed in an account administered by OWRD and drawn upon as costs are actually incurred. If the actual cost of performing the work is less than payments received, OWRD will refund the unspent balance. If the actual cost of processing exceeds the estimate, the Applicant can either elect to terminate this Agreement or amend the Agreement to reflect the increase in cost. The costs stated in this Agreement do not include the statutory application proc sing and filing fees.

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7. **Indemnity.** Applicant shall defend, save, hold harmless, and i), and their officers, employees, and agents from and against all c liabilities, costs and expenses of any nature resulting from or ar s of Applicant or its representatives, officers, employees, contract this Agreement or with respect to the expedited service. The Applicant acknowledges that the Oregon Water Resources Department cannot and does not guarantee a favorable review under the subject regulatory process.

RECEIVED
OCT 22 2021
OWRD

PCA 47126

OREGON WATER RESOURCES DEPARTMENT

OREGON WATER RESOURCES DEPARTMENT

CERTIFICATE REIMBURSEMENT AUTHORITY APPLICANT'S AGREEMENT

Contract Number: **R12827-23**

This Agreement is between the **Oregon Water Resources Department**, hereafter OWRD, and **City of Banks,** hereafter Applicant, hereafter known together as the parties.

OWRD Information	**Applicant's Information**	**Applicant's Representative**
Project Contact: Kerry Kavanagh	Name: Jolyn Becker	Name: Bob Long
Reimbursement Authority	Title: City Manager	Title: Representative
Oregon Water Resources Department	Company: City of Banks	Company: CwM-H2O
725 Summer Street NE	Address: 13680 NW Main Street	Address: 1319 SE MLK Jr Blvd, Suite 204
Salem, OR 97301-1271	Banks, OR 97106	Portland, OR 97214
Phone: 503-979-3208	Phone: 503-254-5112	Phone: 503-954-1326
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PCA 47126

8. **Termination.** Applicant may request to terminate this agreement only in writing at any time during the process. The Applicant agrees to pay for the work done by the Reimbursement Authority personnel up until the time of the written termination request. OWRD, upon receiving such written termination request from the Applicant, will refund any unspent balance after paying the Reimbursement Authority personnel for the work done.

9. **Funds Authorized and Available.** By its execution of this Agreement, Applicants certifies that sufficient funds are authorized and available to cover the expenditures contemplated by this Agreement.

10. **Duration of Estimate.** The Estimate of Time to complete the work is no later than one hundred and twenty days (120) days once this Agreement has been fully executed and payment of the estimated cost deposited. However, this estimate is contingent on the Applicant's expeditious resolution of any deficiency and may be affected by the Department's work load. This Estimate of Time may become null and void after thirty (30) days from the date the Applicant's Agreement is mailed. If the Applicant's Agreement is not received by the Department within thirty (30) days of mailing the Agreement, the Applicant may need to re-apply for a new estimate.

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13. **Amendment and Merger.** The terms of this Agreement shall not be waived, altered, modified, supplemented or amended in any manner whatsoever, except by written instrument signed by both parties. Such waiver, consent, modification or change, if made, shall be effective only in the specific instance and for the specific purpose given. There are no understandings, agreements or representations, oral or written, not specified herein regarding this Agreement.

14. **Signatures.** All parties, by the authorized representative's signature below, hereby acknowledge that they have read this Agreement, understand it and agree to be bound by its terms and conditions.

Applicant: Jolyn Becker
Name: Jolyn Becker
Title: City Manager
Company: City of Banks
Date: 10-14-21

For OWRD: K Kavanagh
Name: Kerry Kavanagh
Water Right Services Division
Date: 11-2-2021

Mail signed Agreement to:

Kerry Kavanagh
Oregon Water Resources Department
725 Summer Street NE, Suite A
Salem, OR 97301-1271

PCA 47126

OREGON WATER RESOURCES DEPARTMENT

CERTIFICATE REIMBURSEMENT AUTHORITY ESTIMATE APPLICATION

ORS 536.055 authorizes the Oregon Water Resources Department to expedite or enhance regulatory processes voluntarily requested under the agreement.

*The purpose of this application is to obtain estimates of the cost and time required to process a Certificate Request. **A separate estimate application is required for each application and/or transfer number. There is a non-refundable application fee of $125.00 per request.***

REQUEST	TYPE	FILE NUMBER	
☒	Certificate Request	Application Number	G-8476
		Permit Number	G-7593
		Transfer Number/Permit Amendment (if applicable)	T10055

	Applicant Information	Applicant's Representative/Contact
Name:	City of Banks (Jolynn Becker, City Manager)	CwM-H2O
Address:	13680 NW Main St.	1319 SE MLK Jr BLVD – Suite 204
	Banks, OR 97106	Portland, OR 97214
Phone:	503-324-5112	503-954-1326
Fax:	503-324-6674	
E-Mail Address:	Jolynn Becker <jbecker@cityofbanks.org>	Bob.Long@cwmh2o.com

I certify that I *(check one):*

☉ have previously filed a Claim of Beneficial Use

☐ am attaching the Claim of Beneficial Use with this request and have included the appropriate claim fee.

I understand the following:

- That upon receipt of my non-refundable application fee in the amount of $ 125.00, OWRD will, within fourteen (14) days, notify me in writing of the estimates of cost and time frame for the expedited service.
- That this fee covers the reimbursement authority staff to evaluate and provide the estimate for processing of the request.
- That upon receiving the estimate I may agree or decline to enter into a formal contract to pay the estimated cost in advance to initiate the expedited service.
- An incomplete or inaccurate Claim of Beneficial Use may delay the process and increase the cost to process my request.
- Expedited processing does not guarantee a favorable review of my request.
- Send completed Application and payment to:

  Oregon Water Resources Department
  Certificate Reimbursement Authority Program
  725 Summer St. NE, Suite A
  Salem, OR 97301-1271

RECEIVED

I certify that I am the *(check one):*

☉ Applicant ☐ Applicant's Representative ☐ Other *(Please specify)* ____

RECEIVED
OCT 22 2021
OWRD

Name: Jolynn Becker

Signature:

OWRD USE ONLY: Reimbursement Authority Number: R12827 - 23

OREGON WATER RESOURCES DEPARTMENT

CERTIFICATE REIMBURSEMENT AUTHORITY ESTIMATE APPLICATION

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		Permit Number	G-7593
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	Banks, OR 97106	Portland, OR 97214
Phone:	503-324-5112	503-954-1326
Fax:	503-324-6674	
E-Mail Address:	Jolynn Becker <jbecker@cityofbanks.org>	Bob.Long@cwmh2o.com

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  Oregon Water Resources Department
  Certificate Reimbursement Authority Program
  725 Summer St. NE, Suite A
  Salem, OR 97301-1271

RECEIVED
OCT 01 2021
OWRD

I certify that I am the *(check one):*

☉ Applicant ☐ Applicant's Representative ☐ Other *(Please specify)* ____

Name: Jolynn Becker

Signature:

OWRD USE ONLY: Reimbursement Authority Number: R12827-23

STATE OF OREGON

WATER RESOURCES DEPARTMENT

725 Summer St. N.E. Ste. A
SALEM, OR 97301-4172
(503) 986-0900 / (503) 986-0904 (fax)

RECEIPT # 136521 INVOICE # _____

RECEIVED FROM: City of Banks
BY: _____

APPLICATION	G-8476
PERMIT	
TRANSFER	

CASH: ☐ CHECK:# ☒ 24263 OTHER: (IDENTIFY) ☐ _____ TOTAL REC'D $ 125.00

1083 TREASURY 4170 WRD MISC CASH ACCT

0407 COPIES 47126 R12827-23 $ _____
0413 OTHER: (IDENTIFY) Certificate Reimbursement Authority $ 125.00
0243 I/S Lease ____ 0244 Muni Water Mgmt. Plan ____ 0245 Cons. Water ____

4270 WRD OPERATING ACCT

MISCELLANEOUS

0407	COPY & TAPE FEES	$
0410	RESEARCH FEES	$
0408	MISC REVENUE: (IDENTIFY) _____	$
TC162	DEPOSIT LIAB. (IDENTIFY) _____	$
0240	EXTENSION OF TIME	$

WATER RIGHTS:		EXAM FEE		RECORD FEE
0201	SURFACE WATER	$	0202	$
0203	GROUND WATER	$	0204	$
0205	TRANSFER	$		

WELL CONSTRUCTION		EXAM FEE		LICENSE FEE
0218	WELL DRILL CONSTRUCTOR	$	0219	$
	LANDOWNER'S PERMIT		0220	$

____ OTHER (IDENTIFY) _____

0536 TREASURY 0437 WELL CONST. START FEE

0211	WELL CONST START FEE	$	CARD#
0210	MONITORING WELLS	$	CARD#

____ OTHER (IDENTIFY) _____

0607 TREASURY 0467 HYDRO ACTIVITY LIC NUMBER

0233	POWER LICENSE FEE (FW/WRD)		$
0231	HYDRO LICENSE FEE (FW/WRD)		$
____	HYDRO APPLICATION		$

TREASURY OTHER / RDX

FUND _____ TITLE _____
OBJ. CODE _____ VENDOR # _____
DESCRIPTION _____ $ _____

ECEIPT: 136521 DATED: 10-1-2021 BY: Mindy Cardoza

Distribution – White Copy - Customer, Yellow Copy - Fiscal, Blue Copy - File, Bu# Copy - Fiscal

RECEIVED
OCT 22 2021
OWRD

STATE OF OREGON
WATER RESOURCES DEPARTMENT
Summer St. N.E. Ste. A
SALEM, OR 97301-4172
(503) 986-0900 / (503) 986-0904 (fax)

RECEIPT # 136671 INVOICE # _____

RECEIVED FROM: City of Banks
BY: _____

APPLICATION	G-8476
PERMIT	
TRANSFER	

CASH: ☐ CHECK:# ☒ 24323 ☐ OTHER: (IDENTIFY) _____

TOTAL REC'D $ 2,000.00

1083 TREASURY 4170 WRD MISC CASH ACCT

0407	COPIES	47126 R12827.23	$
0413	OTHER:	(IDENTIFY) Certificate Reimbursement Authority	$ 2,000.00

0243 I/S Lease ____ 0244 Muni Water Mgmt. Plan ____ 0245 Cons. Water ____

4270 WRD OPERATING ACCT

MISCELLANEOUS

0407	COPY & TAPE FEES	$
0410	RESEARCH FEES	$
0408	MISC REVENUE: (IDENTIFY) _____	$
TC162	DEPOSIT LIAB. (IDENTIFY) _____	$
0240	EXTENSION OF TIME	$

WATER RIGHTS:

		EXAM FEE		RECORD FEE
0201	SURFACE WATER	$	0202	$
0203	GROUND WATER	$	0204	$
0205	TRANSFER	$		

WELL CONSTRUCTION

		EXAM FEE		LICENSE FEE
0218	WELL DRILL CONSTRUCTOR	$	0219	$
	LANDOWNER'S PERMIT		0220	$

____ OTHER (IDENTIFY) _____

0536 TREASURY 0437 WELL CONST. START FEE

0211	WELL CONST START FEE	$	CARD#	
0210	MONITORING WELLS	$	CARD#	

____ OTHER (IDENTIFY) _____

0607 TREASURY 0467 HYDRO ACTIVITY LIC NUMBER

0233	POWER LICENSE FEE (FW/WRD)		$
0231	HYDRO LICENSE FEE (FW/WRD)		$
____	HYDRO APPLICATION		$

____ TREASURY OTHER / RDX

FUND _____ TITLE _____
OBJ. CODE _____ VENDOR # _____
DESCRIPTION _____ $

RECEIPT: 136671 DATED: 10-22-2021 BY: _____

Distribution – White Copy - Customer, Yellow Copy - Fiscal, Blue Copy - File, Buff Copy - Fiscal

STATE OF OREGON
WATER RESOURCES DEPARTMENT
Summer St. N.E. Ste. A
SALEM, OR 97301-4172
(503) 986-0900 / (503) 986-0904 (fax)

RECEIPT # 136671 INVOICE # _____

RECEIVED FROM: City of Banks
BY: _____

APPLICATION	G-8476
PERMIT	
TRANSFER	

CASH: ☐ CHECK:# ☒ 24325 OTHER: (IDENTIFY) _____

TOTAL REC'D $ 2,000.00

1083 TREASURY 4170 WRD MISC CASH ACCT

0407 COPIES 47126 $ _____
0413 OTHER: (IDENTIFY) Certificate Reimbursement Authority R12827.23 $ 2,000.00

0243 I/S Lease _____ 0244 Muni Water Mgmt. Plan _____ 0245 Cons. Water _____

4270 WRD OPERATING ACCT

MISCELLANEOUS

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0410	RESEARCH FEES	$
0408	MISC REVENUE: (IDENTIFY) _____	$
TC162	DEPOSIT LIAB. (IDENTIFY) _____	$
0240	EXTENSION OF TIME	$

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_____ OTHER (IDENTIFY) _____

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_____	HYDRO APPLICATION		$

_____ TREASURY OTHER / RDX

FUND _____ TITLE _____
OBJ. CODE _____ VENDOR # _____
DESCRIPTION _____ $ _____

RECEIPT: 136671 DATED: 10-22-2021 BY: _____

Distribution – White Copy - Customer, Yellow Copy - Fiscal, Blue Copy - File, Buff Copy - Fiscal

CITY OF BANKS

24323

Oregon Water Resource Dept

10/18/2021

Date	Type	Reference	Original Amt.	Balance Due	Discount	Payment
10/18/2021	Bill		2,000.00	2,000.00		2,000.00
					Check Amount	2,000.00

RECEIVED

OCT 22 2021

OWRD

Checking Claim of Beneficial Use (Appl. No. G-8476) 2,000.00

KAVANAGH Kerry L * WRD

From: KAVANAGH Kerry L * WRD
Sent: Thursday, October 14, 2021 11:02 AM
To: jbecker@cityofbanks.org; Bob.long@cwmh2o.com
Cc: KAVANAGH Kerry L * WRD (Kerry.L.Kavanagh@oregon.gov)
Subject: Certificate RA Estimate R12827-23 for City of Banks involving Application G-8476
Attachments: RA estimate request_G-8476.pdf; RA estimate receipt_G-8476.pdf; RA contract_G-8476.pdf

Hello Jolynn and Bob,

Please find the attached estimate and agreement to review the claim of beneficial use. If the proposed agreement is acceptable to you, please return a signed copy to our office along with the payment of the estimated cost to review the claim of beneficial use (COBU).

If you have any questions, please send me an email at kerry.l.kavanagh@oregon.gov.

Thanks,
Kerry

Kerry Kavanagh
Certificate Reimbursement Authority Program Coordinator
Certificate Section, Water Rights Services Division
725 Summer St NE Suite A | Salem OR 97301 | Direct 503.979.3208
kerry.l.kavanagh@oregon.gov| https://www.oregon.gov/OWRD

OREGON WATER RESOURCES DEPARTMENT

Integrity | Service | Technical Excellence | Teamwork | Forward-Looking

OREGON WATER RESOURCES DEPARTMENT

OREGON WATER RESOURCES DEPARTMENT

CERTIFICATE REIMBURSEMENT AUTHORITY APPLICANT'S AGREEMENT

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Reimbursement Authority	Title: City Manager	Title: Representative
Oregon Water Resources Department	Company: City of Banks	Company: CwM-H2O
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Salem, OR 97301-1271	Banks, OR 97106	Portland, OR 97214
Phone: 503-979-3208	Phone: 503-254-5112	Phone: 503-954-1326
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PCA 47126

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Applicant: _____
Name: Jolyn Becker
Title: City Manager
Company: City of Banks
Date: _____

For OWRD: _____
Name: Kerry Kavanagh
Water Right Services Division
Date: _____

Mail signed Agreement to:

Kerry Kavanagh
Oregon Water Resources Department
725 Summer Street NE, Suite A
Salem, OR 97301-1271

PCA 47126

STATE OF OREGON

WATER RESOURCES DEPARTMENT

725 Summer St. N.E. Ste. A
SALEM, OR 97301-4172
(503) 986-0900 / (503) 986-0904 (fax)

RECEIPT # 136521

INVOICE # _____

RECEIVED FROM: City of Banks

BY: _____

APPLICATION	G-8476
PERMIT	
TRANSFER	

CASH: ☐ CHECK:# ☒ 24263 OTHER: (IDENTIFY) ☐ _____

TOTAL REC'D $ 125.00

1083 TREASURY 4170 WRD MISC CASH ACCT

0407	COPIES 47126	R12827-23	$
0413	OTHER: (IDENTIFY)	Certificate Reimbursement Authority	$ 125.00

0243 I/S Lease _____ 0244 Muni Water Mgmt. Plan _____ 0245 Cons. Water _____

4270 WRD OPERATING ACCT

	MISCELLANEOUS				
0407	COPY & TAPE FEES				$
0410	RESEARCH FEES				$
0408	MISC REVENUE: (IDENTIFY)	_____			$
TC162	DEPOSIT LIAB. (IDENTIFY)	_____			$
0240	EXTENSION OF TIME				$
	WATER RIGHTS:	**EXAM FEE**		**RECORD FEE**	
0201	SURFACE WATER	$	0202	$	
0203	GROUND WATER	$	0204	$	
0205	TRANSFER	$			
	WELL CONSTRUCTION	**EXAM FEE**		**LICENSE FEE**	
0218	WELL DRILL CONSTRUCTOR	$	0219	$	
	LANDOWNER'S PERMIT		0220	$	

_____ OTHER (IDENTIFY) _____

0536 TREASURY 0437 WELL CONST. START FEE

0211	WELL CONST START FEE	$	CARD#	
0210	MONITORING WELLS	$	CARD#	

_____ OTHER (IDENTIFY) _____

0607 TREASURY 0467 HYDRO ACTIVITY

		LIC NUMBER	
0233	POWER LICENSE FEE (FW/WRD)		$
0231	HYDRO LICENSE FEE (FW/WRD)		$
_____	HYDRO APPLICATION		$

_____ TREASURY OTHER / RDX

FUND _____ TITLE _____

OBJ. CODE _____ VENDOR # _____

DESCRIPTION _____ $

RECEIPT: 136521 DATED: 10-1-2021 BY: Mindy Cardwell

Distribution – White Copy - Customer, Yellow Copy - Fiscal, Blue Copy - File, Buff Copy - Fiscal

STATE OF OREGON
WATER RESOURCES DEPARTMENT
725 Summer St. N.E. Ste. A
SALEM, OR 97301-4172
(503) 986-0900 / (503) 986-0904 (fax)

RECEIPT # 136521 INVOICE # _____

RECEIVED FROM: City of Banks
BY: _____

APPLICATION	G-8476
PERMIT	
TRANSFER	

CASH: ☐ CHECK: ☒ 24263 OTHER: (IDENTIFY) ☐ _____

TOTAL REC'D $ 125.00

1083 TREASURY 4170 WRD MISC CASH ACCT

0407	COPIES	47126 R126271-23	$
0413	OTHER:	(IDENTIFY) Certificate Reimbursement Authority	$ 125.00

0243 I/S Lease ____ 0244 Muni Water Mgmt. Plan ____ 0245 Cons. Water ____

4270 WRD OPERATING ACCT

MISCELLANEOUS

0407	COPY & TAPE FEES	$
0410	RESEARCH FEES	$
0408	MISC REVENUE: (IDENTIFY) _____	$
TC162	DEPOSIT LIAB. (IDENTIFY) _____	$
0240	EXTENSION OF TIME	$

WATER RIGHTS:

		EXAM FEE		RECORD FEE
0201	SURFACE WATER	$	0202	$
0203	GROUND WATER	$	0204	$
0205	TRANSFER	$		

WELL CONSTRUCTION

		EXAM FEE		LICENSE FEE
0218	WELL DRILL CONSTRUCTOR	$	0219	$
	LANDOWNER'S PERMIT		0220	$

_____ OTHER (IDENTIFY) _____

0536 TREASURY 0437 WELL CONST. START FEE

0211	WELL CONST START FEE	$	CARD#	
0210	MONITORING WELLS	$	CARD#	

_____ OTHER (IDENTIFY) _____

0607 TREASURY 0467 HYDRO ACTIVITY LIC NUMBER

0233	POWER LICENSE FEE (FW/WRD)		$
0231	HYDRO LICENSE FEE (FW/WRD)		$
_____	HYDRO APPLICATION		$

_____ TREASURY OTHER / RDX

FUND _____ TITLE _____
OBJ. CODE _____ VENDOR # _____
DESCRIPTION _____ $

RECEIPT: 136521 DATED: 10-1-2021 BY: Mindy Cardum

Distribution – White Copy - Customer, Yellow Copy - Fiscal, Blue Copy - File, Buff Copy - Fiscal

CITY OF BANKS

24263

Oregon Water Resource Dept

9/27/2021

Date	Type	Reference	Original Amt.	Balance Due	Discount	Payment
9/27/2021	Bill		125.00	125.00		125.00
					Check Amount	125.00

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Checking

Certificate Request: Appl #G-8476/Perm #G-759

125.00

OREGON WATER RESOURCES DEPARTMENT
CERTIFICATE REIMBURSEMENT AUTHORITY ESTIMATE APPLICATION

ORS 536.055 authorizes the Oregon Water Resources Department to expedite or enhance regulatory processes voluntarily requested under the agreement.

The purpose of this application is to obtain estimates of the cost and time required to process a Certificate Request. ***A separate estimate application is required for each application and/or transfer number. There is a non-refundable application fee of $125.00 per request.***

REQUEST	TYPE	FILE NUMBER	
☒	Certificate Request	Application Number	G-8476
		Permit Number	G-7593
		Transfer Number/Permit Amendment (if applicable)	T10055

	Applicant Information	Applicant's Representative/Contact
Name:	City of Banks (Jolynn Becker, City Manager)	CwM-H2O
Address:	13680 NW Main St.	1319 SE MLK Jr BLVD – Suite 204
	Banks, OR 97106	Portland, OR 97214
Phone:	503-324-5112	503-954-1326
Fax:	503-324-6674	
E-Mail Address:	Jolynn Becker <jbecker@cityofbanks.org>	Bob.Long@cwmh2o.com

I certify that I *(check one):*

- ◉ have previously filed a Claim of Beneficial Use
- ○ am attaching the Claim of Beneficial Use with this request and have included the appropriate claim fee.

I understand the following:

- That upon receipt of my non-refundable application fee in the amount of **$ 125.00**, OWRD will, within fourteen (14) days, notify me in writing of the estimates of cost and time frame for the expedited service.
- That this fee covers the reimbursement authority staff to evaluate and provide the estimate for processing of the request.
- That upon receiving the estimate I may agree or decline to enter into a formal contract to pay the estimated cost in advance to initiate the expedited service.
- An incomplete or inaccurate Claim of Beneficial Use may delay the process and increase the cost to process my request.
- Expedited processing does not guarantee a favorable review of my request.
- Send completed Application and payment to:

  Oregon Water Resources Department
  Certificate Reimbursement Authority Program
  725 Summer St. NE, Suite A
  Salem, OR 97301-1271

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I certify that I am the *(check one):*

◉ Applicant ○ Applicant's Representative ○ Other *(Please specify)* ____

Name: Jolynn Becker

Signature: Jolynn Becker

OWRD USE ONLY: Reimbursement Authority Number: R12827-23

Oregon
Tina Kotek, Governor

Water Resources Department
North Mall Office Building
725 Summer St NE, Suite A
Salem, OR 97301
Phone 503 986-0900
Fax 503 986-0904
www.oregon.gov/owrd

March 13, 2023

CITY OF BANKS
ATTENTION: JOLYNN BECKER, CITY MANAGER
13680 NW MAIN STREET
BANKS OR 97106

RE: Application G-8476, Permit G-7593

Dear Ms. Becker,

The Department has received an email correspondence from Bob Long, representing the City of Banks, requesting that the Claim of Beneficial Use (Claim) submitted on September 13, 2021, be withdrawn.

Enclosed is the original Claim submitted for the above referenced file. The Department has retained a copy of the original Claim, however due to your request, the Department will not consider the Claim as valid.

If you have any additional questions, please send an email to Kerry.L.Kavanagh@water.oregon.gov or call me at (503) 979-3208.

Sincerely,

K Kavanagh

Kerry Kavanagh
Reimbursement Authority, Certificates
Water Right Service Division

cc: File G-8476
Bob Long, CWRE, 1319 SE MLK Jr Blvd, Suite 204, Portland OR 97214

enclosures

CwM-H2O
Complete Water Management

Pacific Northwest

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August 25, 2021

Oregon Water Resources Department
725 Summer St. NE Ste A
Salem, Oregon 97301

RE: CITY OF BANKS – CLAIM OF BENEFICIAL USE PERMIT G-7593 WELL 1

Dear Claim of Beneficial Use Specialist,

Please find enclosed with this letter a completed Claim of Beneficial Use from the City of Banks for Permit G-7593, Well 1. Please note that simultaneously with OWRD's approval of this COBU, the City of Banks withdraws Transfer T-10055.

The City of Banks has attached a check for the Statutory fee of $230.00.

Please let us know if there are any questions or if any additional information is needed.

Thank you for your assistance.

Sincerely,

CwM H2O, L.L.C.

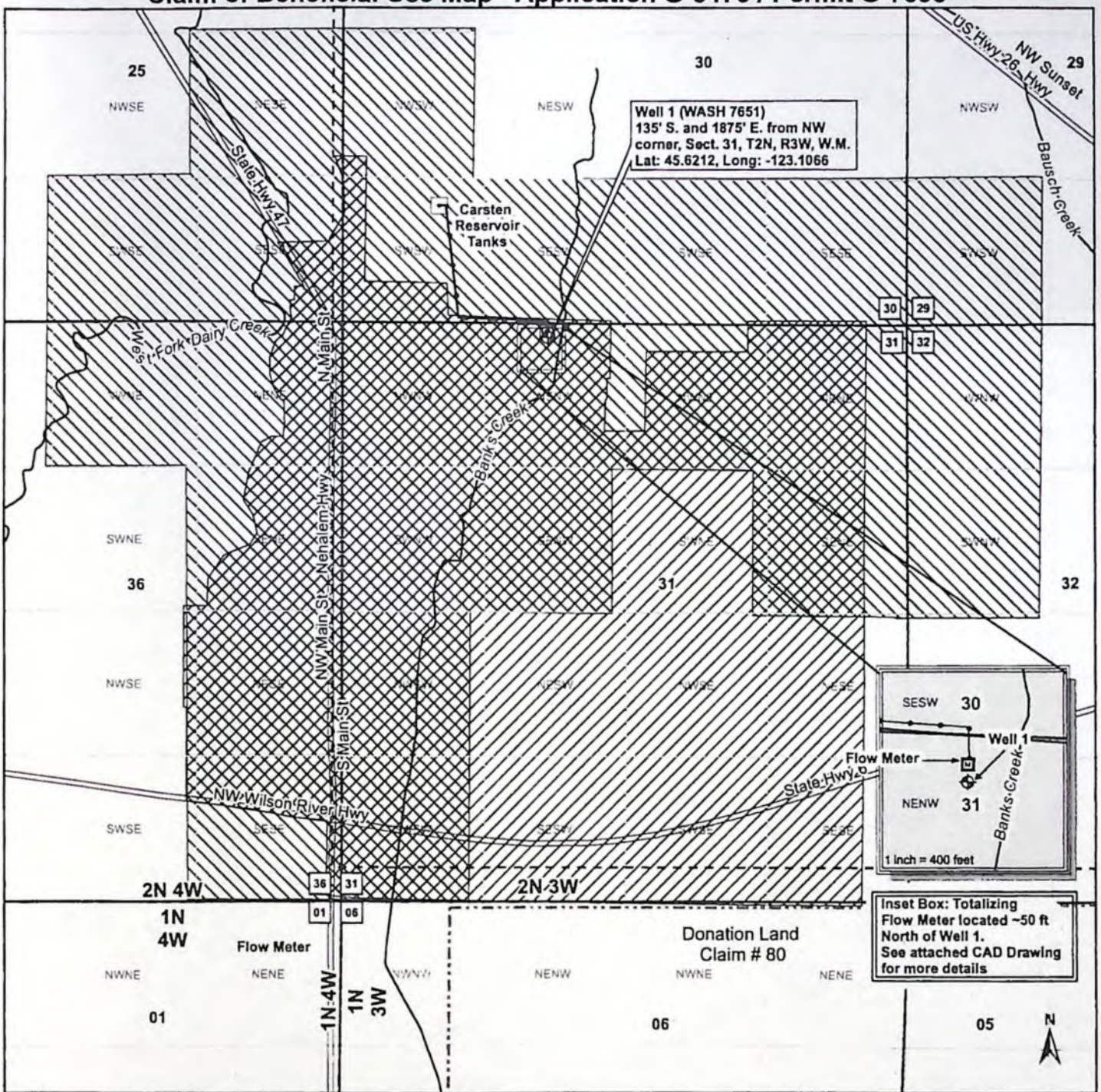
Robert Long, CWRE

Enclosures (2):
1. Completed and Signed CBU for Permit G-7593
2. Check for $230.00 fee

Copy: J. Becker
L. Schroeder

1319 SE MLK Jr. Blvd, Suite 204, Portland, Oregon 97214
Complete Water Management | CwMH2O.com

Claim of Beneficial Use Map - Application G-8476 / Permit G-7593



City of Banks
Well 1 (WASH 7651)
Application; G-8476
Permit: G-7593

T. 2N., R. 3W. W.M. Sect. 29, 30, 31, 32
T. 2N., R. 4W. W.M. Sect. 25 and 36

Legend

- Well 1 (WASH 7651)
- Magnetic Flow Meter in Vault
- Carsten Reservoir Tanks
- Water line (6" pvc)
- Streams
- Highways
- Place of Use per Permit 7593
- Banks Service Area per UGB
- Donation Land Claim
- Township/Range
- 31 Sections
- NENW 1/4, 1/4 Sections

BANKS
13680 NW Main Street
Banks, Oregon 97106

CWRE SEAL:

CwM-H2O
Complete Water Management
1319 SE MLK JR BLVD #204
Portland, OR 97214

0 660 1,320 FT

1 inch = 1,320 ft

This map is not intended to provide legal dimensions or property ownership lines.

C:\01 Projects\1501004 Water Supply Development\6 Applications\CBU\Well 1\Banks_CBU_WASH7651_17Mar2020.pdf JST

CLAIM OF BENEFICIAL USE for Groundwater Permits claiming more than 0.1 cfs

Oregon Water Resources Department
725 Summer Street NE, Suite A
Salem, Oregon 97301-1266
(503) 986-0900
www.wrd.state.or.us

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A fee of ~~$200~~ $230 must accompany this form for permits with priority dates of July 9, 1987, or later.

A separate form shall be completed for each permit.

In cases where a permit has been amended through the permit amendment process, a separate claim for the permit amendment is not required. Incorporate the permit amendment into the claim for the permit.

This form is subject to revision. **Begin each new claim** by checking for a new version of this form at: http://www.oregon.gov/owrd/pages/wr/cwre_info.aspx

The completion of this form is required by OAR 690-014-0100(1) and 690-014-0110(4).

Please type or print in dark ink. If this form is found to contain errors or omissions, it may be returned to you. **Every item must have a response.** If any requested information does not apply to the claim, insert "NA." **Do not delete or alter any section of this form unless directed by the form.** The Department may require the submittal of additional information from any water user or authorized agent.

"Section 8" of this form is intended to aid in the completion of this form and should not be submitted.

A claim of beneficial use includes both this report and a map. If the map is being mailed separately from this form, please include a note with this form indicating such.

If you have questions regarding the completion of this form, please call 503-986-0900 and ask for the Certificate Section.

The Department has a program that allows it to enter into a voluntary agreement with an applicant for expedited services. Under such an agreement, the applicant pays the cost to hire additional staff that would not otherwise be available. This program means a certificate may be issued in about a month. For more information on this program see http://www.oregon.gov/owrd/pages/mgmt_reimbursement_authority.aspx

SECTION 1
GENERAL INFORMATION

1. File Information

APPLICATION #	PERMIT # (IF APPLICABLE)	PERMIT AMENDMENT # (IF APPLICABLE)
G-8476	**G-7593**	**T-10055**

2. Property Owner (current owner information)

APPLICANT/BUSINESS NAME		PHONE NO.	ADDITIONAL CONTACT NO.
CITY of BANKS		**503-324-5112**	
ADDRESS **13680 NW Main Street**			
CITY **Banks**	STATE **OR**	ZIP **97106**	E-MAIL **jbecker@cityofbanks.org**

If the current property owner is not the permit holder of record, it is recommended that an assignment be filed with the Department. ***Each*** *permit holder of record must sign this form.*

3. Permit holder of record (this may, or may not, be the current property owner)

PERMIT HOLDER OF RECORD **CITY of BANKS (Jolynn Becker, City Manager)**		RECEIVED
ADDRESS **13680 NW Main Street**		SEP 13 2021
CITY **Banks**	STATE **OR**	ZIP **97106** OWRD

ADDITIONAL PERMIT HOLDER OF RECORD		
ADDRESS		
CITY	STATE	ZIP

4. Date of Site Inspection: **April 23, 2019**

5. Person(s) interviewed and description of their association with the project:

NAME	DATE	ASSOCIATION WITH THE PROJECT
Tom Tulski	**April 23, 2019**	**Public Works Supervisor**

6. County: **Washington**

7. If any property described in the place of use of the permit is excluded from this report, identify the owner of record for that property (ORS 537.230(4)):

OWNER OF RECORD		
ADDRESS		
CITY	STATE	ZIP

Add additional tables for owners of record as needed

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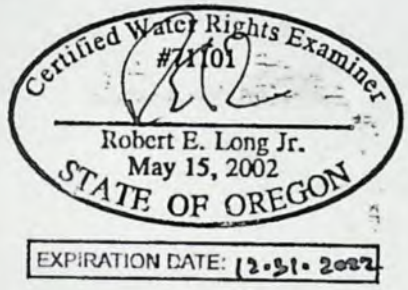
SECTION 2
SIGNATURES

CWRE Statement, Seal and Signature

The facts contained in this Claim of Beneficial Use are true and correct to the best of my knowledge.

Seal and Signature



CWRE NAME		PHONE NO.	ADDITIONAL CONTACT NO.
Robert Long		**503-954-1326**	**503-799-0304**
ADDRESS **1319 SE MLK JR BLVD, Suite 204**			
CITY **Portland**	STATE **OR**	ZIP **97214**	E-MAIL **Bob.Long@cwmh2o.com**

Permit Holder of Record Signature or Acknowledgement

Each *permit holder of record must sign this form in the space provided below.*

The facts contained in this Claim of Beneficial Use are true and correct to the best of my knowledge. I request that the Department issue a water right certificate.

SIGNATURE	PRINT OR TYPE NAME	TITLE	DATE
	Jolynn Becker	**City Manager**	9-1-2021

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SECTION 3
CLAIM DESCRIPTION

1. Point of appropriation name or number:

POINT OF APPROPRIATION (POA) NAME OR NUMBER (CORRESPOND TO MAP)	WELL LOG ID # FOR ALL WORK PERFORMED ON THE WELL (IF APPLICABLE)	WELL TAG # (IF APPLICABLE)
Well 1 (Behrman Well)	**WASH 7651**	**NA**

Attach each well log available for the well (include the log for the original well and any subsequent alterations, reconstructions, or deepenings)

2. Point of appropriation source, if indicated on permit:

POA NAME OR NUMBER	SOURCE BASIN LOCATED WITHIN	TRIBUTARY
Well 1	**West Fork Dairy Creek**	**West Fork Dairy Creek**

3. Developed use(s), period of use, and rate for each use:

POA NAME OR NUMBER	USES	IF IRRIGATION, LIST CROP TYPE	SEASON OR MONTHS WHEN WATER WAS USED	ACTUAL RATE OR VOLUME USED (CFS, GPM, OR AF)
Well 1 (WASH 7651)	**Municipal**	**-NA-**	**Year Round**	**300 GPM**
Total Quantity of Water Used				**0.67 cfs***

**** The recent approval of the City's WMCP (Final/Special Order 120-798, dated 06/14/2021) has given the greenlight for the full rate of 0.67 cfs***

4. Provide a general narrative description of the distribution works. This description must trace the water system from **each** point of appropriation to the place of use:

Well 1 (WASH 7651), located 135 FT South and 560 FT West from the ¼ corner on the north line of NENW in Section 31, T. 2N., R. 3W., W.M.* pumps water in a pipe approximately 850 ft west along NW Banks Road and then North up an approximate 1075' driveway to the Carsten Reservoir Storage Tanks. These reservoir tanks then feed the City's water distribution system.
***Location based on Permit description.**

Reminder: The map associated with this claim must identify the location of the point(s) of diversion, Donation Land Claims (DLC), Government Lots (GLot), and Quarter-Quarters (QQ).

5. Variations:

Was the use developed differently from what was authorized by the permit, permit amendment final order, or extension final order? If yes, describe below. **YES** **(NO)**

(e.g. *"The permit allowed three points of appropriation. The water user only developed one of the points."* or *"The permit allowed 40.0 acres of irrigation. The water user only developed 10.0 acres."*)

***Just a quick note, the Permit description of Well 1's location is: 135 FT South and 560 FT West from the ¼ corner on the north line of NENW in Section 31, T. 2N., R. 3W., W.M., however a GIS/Imagery measurement of the location puts it at: approximately 135 FT South and 1875' East from the NW corner, Section 31. The latitude (45.6212) and longitude (-123.1066) coordinate provided for WASH 7651 in OWRD's Well Report Query appears accurate. The use was developed consistently with what was authorized in all issued permits and final orders.**

6. Claim Summary:

POA NAME OR #	MAXIMUM RATE AUTHORIZED	CALCULATED THEORETICAL RATE BASED ON SYSTEM	AMOUNT OF WATER MEASURED	USE	# OF ACRES ALLOWED	# OF ACRES DEVELOPED
Well 1	**0.67 cfs**	**1.01 cfs**	**0.76 cfs****	**Municipal**	**-NA-**	**-NA -**

****Daily Production Data recorded by the City of Banks show a pump rate of 0.76 cfs occurred on September 17, 2016 for ~ 32minutes.***

SECTION 4

SYSTEM DESCRIPTION

Are there multiple POAs? YES (NO)

If *"YES"* you will need to copy and complete Sections 4B through 4F for each POA.

POA Name or Number this section describes (only needed if there is more than one):

A. Place of Use

1. Is the right for municipal use? (YES) NO

If "YES" the table below may be deleted.

Reminder: The map associated with this claim must identify Donation Land Claims (DLC), Government Lots (GLot), Quarter Quarters (QQ), and if for irrigation, the number of acres irrigated within each projected DLC, GLot, and QQ.

B. Diversion and Delivery System Information

Provide the following information concerning the diversion and delivery system. Information provided must describe the equipment used to transport and apply the water from the point of appropriation to the place of use.

1. Is a pump used? (YES) NO

If "NO" items 2 through item 6 may be deleted.

2. Pump Information

MANUFACTURER	MODEL	SERIAL NUMBER	TYPE (CENTRIFUGAL, TURBINE OR SUBMERSIBLE)	INTAKE SIZE	DISCHARGE SIZE
-NA-	-NA-	Unknown	Turbine	-NA-	-NA-

3. Motor Information

MANUFACTURER	HORSEPOWER
U.S. Electrical	40 HP

4. Theoretical Pump Capacity

HORSEPOWER	OPERATING PSI	LIFT FROM SOURCE TO PUMP *IF A WELL, THE WATER LEVEL DURING PUMPING	LIFT FROM PUMP TO PLACE OF USE	TOTAL PUMP OUTPUT (IN CFS)
40 HP		96 FT	182.5 FT	1.01 CFS

5. Provide pump calculations:

City of Banks Well 1 Behrman Well (WASH 7651)

Pump Capacity Calculation Sheet
using Department designed formula:

(hp)(efficiency) / (lift + psi head) = capacity in cfs

Efficiency:

Centrifugal = 6.61
Turbine = 7.04

Data Entry (fill in underlined blanks)

HP =	40
Efficiency =	7.04
Lift =	278.5
PSI =	

Results Calculated

(hp)(efficiency) =	281.6
Head based on psi =	0.0
Total dynamic head = (head + lift)	278.5

Pump Capacity = 1.01 cubic feet per second

Lift numbers and calculations based on a 2/17/2020 email to/from Rob Peacock of Kennedy-Jenks (the City Engineer) and a follow-up phone call on 2/24/2020 between Bob Long (the City's Water Consultant) and Rob Peacock.

Lift = Static water level measurement (measured at 96FT on 2/28/19) + change in elevation between Tank Floor (390') & Wellhead ground surface (231.5') + tank overflow (24')
Lift = 96' +(390' - 231.5') +24'
Lift = 96' + 158.5' +24'
Lift = 278.5 '

6. Measured Pump Capacity (using meter if meter was present and system was operating)

Initial Meter Reading	Ending Meter Reading	Duration of Time Observed	Total Pump Output (in cfs)
		Approx. .5 hrs	**0.76 cfs (Sept. 17, 2016)**

Reminder: For pump calculations use the reference information at the end of this document.

7. Is the distribution system piped? **(YES)** **NO**

If "NO" items 8 through item 11 may be deleted.

8. Mainline Information

MAINLINE SIZE	LENGTH	TYPE OF PIPE	BURIED OR ABOVE GROUND
~ 6 inches	~1,995 feet	PVC	Buried

9. Lateral or Handline Information **NA**

LATERAL OR HANDLINE SIZE	LENGTH	TYPE OF PIPE	BURIED OR ABOVE GROUND

10. Sprinkler Information **NA**

SIZE	OPERATING PSI	SPRINKLER OUTPUT (GPM)	TOTAL NUMBER OF SPRINKLERS	MAXIMUM NUMBER USED	TOTAL SPRINKLER OUTPUT (CFS)

Reminder: For sprinkler output determination use the reference information at the end of this document.

11. Pivot Information **NA**

MANUFACTURER	MAXIMUM WETTED RADIUS	OPERATING PSI	TOTAL PIVOT OUTPUT (GPM)	TOTAL PIVOT OUTPUT (CFS)

12. Additional notes or comments related to the system:

Well 1 pumps to a 6" PVC mainline that delivers all ground water to the City's reservoir storage tanks. The mainline is approximately 1,995 feet long and has a total lift from the static water level measurement of 96 FT (2/28/2019) to the top of the reservoir (182.5 ft) of approximately 278.5 feet.

C. Groundwater Source Information (Well and Sump)

1. Is the appropriation from ground water (well or sump)? (YES) NO

If "NO", items 2 through 8 relating to this section may be deleted.

2. Describe the access port (type and location) or other means to measure the water level in the well:

Well 1 has an access port with screw top. SCADA transducers also installed.

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3. If well logs are not available, provide as much of the following information as possible:

CASING DIAMETER	CASING DEPTH	TOTAL DEPTH	COMPLETION DATE OF ORIGINAL WELL	COMPLETION DATES OF ALTERATIONS	WHO THE WELL WAS DRILLED FOR	WELL DRILLED BY
8 5/8"	210 FT	450 FT	8/24/1977		City of Banks	A.M. Jannsen Drilling Co.

4. In addition to the information requested in item "3" above, provide any other information which may help the Department locate any well logs associated with this appropriation.

WASH 7651

5. Is the appropriation from a dug well (sump)? YES (NO)

If "NO", items 6 through 8 relating to this section may be deleted.

Reminder: Construction standards for sumps can be found in OAR 690-210-0400.

D. Storage

1. Does the distribution system include in-system storage (e.g. storage tank, bulge in system / reservoir) (YES) NO

If "NO", item 2 and 3 relating to this section may be deleted.

If "YES" is it a: Storage Tank (YES) NO

Bulge in System / Reservoir YES (NO)

Complete appropriate table(s), unused table may be deleted.

2. Storage Tank:

MATERIAL (CONCRETE, FIBERGLASS, METAL, ETC.)	CAPACITY (IN GALLONS)	ABOVE GROUND OR BURIED
Concrete (Carsten Reservoir Storage Tanks, connected to Well 1)	**1.50 MG**	**Above Ground**
Concrete (North Star Reservoir Storage Tank)	**0.07 MG**	**Above Ground**
Steel/concrete (Clearwell Reservoir Storage Tank)	**0.22 MG**	**Above Ground**

3. Bulge in System / Reservoir:

RESERVOIR NAME OR NUMBER (CORRESPOND TO MAP)	APPROXIMATE DAM HEIGHT	APPROXIMATE CAPACITY (IN ACRE FEET)
-NA-		

E. Gravity Flow Pipe

(THE DEPARTMENT TYPICALLY USES THE HAZEN-WILLIAM'S FORMULA FOR A GRAVITY FLOW PIPE SYSTEM)

1. Does the system involve a gravity flow pipe? YES (NO)

If "NO", items 2 through 4 relating to this section may be deleted.

F. Gravity Flow Canal or Ditch -NA-

(THE DEPARTMENT TYPICALLY USES MANNING'S FORMULA FOR CANALS AND DITCHES)

1. Is a gravity flow canal or ditch used to convey the water as part of the distribution system? YES (NO)

If "NO", items 2 through 4 relating to this section may be deleted.

SECTION 5
CONDITIONS

All conditions contained in the permit, permit amendment, or any extension final order shall be addressed. Reports that do not address all performance related conditions will be returned.

1. Time Limits:

Permits and extension final orders contain any or all of the following dates: the date when the actual construction work was to begin, the date when the construction was to be completed, and the date when the complete application of water to the proposed use was to be completed. These dates may be referred to as ABC dates. Describe how the water user has complied with each of the development timelines established in the permit or permit extension order:

	Date from Permit	Date Accomplished*	Description of Actions Taken by Water User to Comply with the Time Limits
Issuance Date	12/12/1977		
Begin construction (A)	on or before 12/2/1978	8/16/1977	Drilling Started
Complete construction (B)	on or before 10/01/1979, - extended to 10/01/2027 by Final Order 107-308	8/24/1977	Well completed
Complete application of water (C)	On or before 10/01/1980. - extended to 10/01/2027 by Final Order 107-308	January 1989	Wellhead design and construction completed, Began water use reporting

* MUST BE WITHIN PERIOD BETWEEN PERMIT, OR ANY EXTENSION FINAL ORDER ISSUANCE AND THE DATE TO COMPLETELY APPLY WATER

2. Is there an extension final order(s)? (YES) NO

3. Initial Water Level Measurements: **First water depth: 130 ft, post static level: 34 ft**

a. Was the water user required to submit an initial static water level measurement? YES (NO)

If "NO", items 4b through 4d relating to this section may be deleted.

b. What month was the initial measurement to be taken in?

c. Was the measurement submitted to the Department? (YES) NO

d. If the initial measurement was not submitted, provide that measurement now, if available:

Date of Measurement	Measurement Made By	Method	Measurement

4. Annual Static Water Level Measurements:

a. Was the water user required to submit annual static water level measurements? YES (NO)

If "NO", items 5b through 5e relating to this section may be deleted.

5. Pump Test (Required for most ground water permits prior to issuance of a certificate)

a. Did the permit require the submittal of a pump test? (YES) NO

If "NO", items 6b through 6e relating to this section may be deleted.

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b. Has the pump test been previously submitted to the Department? YES (NO)

c. Is the pump test attached to this claim? YES (NO)

d. Has the pump test been approved by the Department? YES (NO)

e. Has a pump test exemption been approved by the Department? YES (NO)

**** Claims will not be reviewed until a pump test or exemption has been approved by the Department. A Pump test exemption request was submitted to the Department on 3/29/21**

6. Measurement Conditions:

a. Does the permit, permit amendment, or any extension final order require the installation of a meter approved measuring device? (YES) NO

If "NO", items 7b through 7f relating to this section may be deleted.

Reminder: If a meter or approved measuring device was required, the COBU map must indicate the location of the device in relation to the point of diversion or appropriation.

b. Has a meter been installed? (YES) NO

c. Meter Information

POD/POA NAME OR #	MANUFACTURER	SERIAL #	CONDITION (WORKING OR NOT)	CURRENT METER READING	DATE INSTALLED
Well 1	**Siemans**		**Working**		**7/24/2012**

If a meter has been installed, items 7d through 7f relating to this section may be deleted.

7. Recording and reporting conditions

a. Is the water user required to report the water use to the Department? YES (NO)

If "NO", item 7b relating to this section may be deleted.

b. Have the reports been submitted? (YES) NO
If the reports have not been submitted, attach a copy of the reports if available.

8. Other conditions required by permit, permit amendment final order, or extension final order:

a. Were there special well construction standards? YES (NO)

b. Was submittal of a ground water monitoring plan required? YES (NO)

c. Was submittal of a water management and conservation plan required? (YES) NO

d. Other conditions? YES (NO)

If "YES" to any of the above, identify the condition and describe the water user's actions to comply with the condition(s):

The City of Banks' updated Water Management Conservation Plan (WMCP) was approved by FO 120-798 on June 14, 2021.

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SECTION 6

ATTACHMENTS

Provide a list of any additional documents you are attaching to this report:

ATTACHMENT NAME	DESCRIPTION
Claim of Beneficial Use Map	As requested in Section 7
CAD drawing of Well Piping	CAD drawing of Well piping that shows location of the totalizing flow meter
Pump Test Exemption Request Form	Well 1 (WASH 7651) is only 67' away from Well 2 (WASH 62373), which has an accepted pump test and similar characteristics. A pump text exemption for Well 1 was submitted to OWRD on 3/29/2021 and is under review
Well Log for WASH 7651	

SECTION 7

CLAIM OF BENEFICIAL USE MAP

The Claim of Beneficial Use Map must be submitted with this claim. Claims submitted without the Claim of Beneficial Use map will be returned. The map shall be submitted on poly film at a scale of 1" = 1320 feet, 1" = 400 feet, or the original full-size scale of the county assessor map for the location.

Provide a general description of the survey method used to prepare the map. Examples of possible methods include, but are not limited to, a traverse survey, GPS, or the use of aerial photos. If the basis of the survey is an aerial photo, provide the source, date, series and the aerial photo identification number.

The map integrates multiple sources:

- The location of Well 1 (WASH 7651) is taken from the description in Permit G7593 and the OWRD Well Report Points geodatabase downloaded on 1/13/2020. The WR GR TRAN map has it located at Latitude 45.6212, Longitude -123.1066
- The Urban Growth Boundary (UGB) (i.e., the City's Service Area) was derived from Metro's RLIS Discovery web resource: http://rlisdiscovery.oregonmetro.gov/?
- The base imagery used for marking the location of the larger Carsten Reservoir Tank was a 2014 USDA-FSA-APFO NAIP MrSID Mosaic covering Washington County (Ortho Image ortho_1-1_1n_s_or067_2014_1.sid).
- The location of the Totalizing Flow Meter is estimated based on 1.) the description from the CWRE and 2.) the attached CAD drawing of Well Piping.
- StreamNet.org was consulted to identify locations of fish screens or passage devices, none were identified.

Map Checklist

Please be sure that the map you submit includes ALL the items listed below.
(Reminder: Incomplete maps and/or claims may be returned.)

☒ Map on polyester film

☒ Appropriate scale (1" = 400 feet, 1" = 1320 feet, or the original full-size scale of the county assessor map)

☒ Township, Range, Section, Donation Land Claims, and Government Lots

☒ If irrigation, number of acres irrigated within each projected Donation Land Claims, Government Lots, Quarter-Quarters

☒ Locations of fish screens and/or fish by-pass devices in relationship to point of diversion

☒ Locations of meters and/or measuring devices in relationship to point of diversion or appropriation

- ☒ Conveyance structures illustrated (pumps, reservoirs, pipelines, ditches, etc.)
- ☒ Point(s) of diversion or appropriation (illustrated and coordinates)
- ☒ (NA for Municipalities) Tax lot boundaries and numbers
- ☒ Source illustrated if surface water
- ☒ Disclaimer ("This map is not intended to provide legal dimensions or locations of property ownership lines")
- ☒ Application and permit number or transfer number
- ☒ North arrow
- ☒ Legend
- ☒ CWRE stamp and signature

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OREGON WATER RESOURCES DEPARTMENT

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SEP 13 2021
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PUMP TEST UNREASONABLE BURDEN EXEMPTION REQUEST FORM

OWNER NAME/BUSINESS NAME:	PHONE NO.:	ADDITIONAL CONTACT NO.:
City of Banks	503-324-5112	Bob Long PG CWRE
ADDRESS: 13680 NW Main Street		503-799 0304
CITY: Banks / STATE: OR / ZIP: 97106 / E-MAIL: jbecker@cityofbanks.org		

If there is a reason why a pump test cannot be performed on a well, the owner may request from the Director an exemption from the pump test requirement. Requests shall be in writing and include the reason why a pump test cannot be performed. Exemptions, or conditioned exemptions, shall be granted if the reasons are found to valid and eliminating the problem would place an unreasonable burden on the well owner. Exemptions shall be granted for public water supply wells if pump testing will cause interruption of service to customers. OAR 690-217-0015(3).

1. List each well and associated water right(s) for which you are requesting an exemption. If a well is listed on more than one water right, be sure to include them all here. If additional space is needed, please attach another form. If available, please attach all water well reports (i.e. well logs) and a map showing the locations of all wells listed on this form.

	WELL LOG # (EX. MARI 99999)	WELL TAG # (EX. L-999999)	WELL NAME OR #	APPLICATION	PERMIT	TRANSFER
a	WASH 7651	L-	Well 1 or Behrman Well	G-8476	G-7593	T-10055
b		L-		G-	G-	T-
c		L-		G-	G-	T-
d		L-		G-	G-	T-
e		L-		G-	G-	T-

(CONTINUED)

	TWP (EX: 25S)	RNG (EX: 31E)	SEC (EX: 12)	QQ (EX: SE/SW)	SURVEYED LOCATION (Ex: 100 ft N & 735 ft E fr SE cor, sec 5)	LATITUDE (Ex: 44.94473859)	LONGITUDE (Ex: -123.02787000)
a	2N	3W	31	NENW	135 FT S. and 560 FT W. from NW corner of Sect. 31	~45.6212	~123.1066
b							
c							
d							
e							

2. Please explain why the test cannot be performed:

The City of Banks uses both Well 1 and Well 2 to meet its municipal water requirements.

Well 1 (WASH 7651) is located approximately 67 feet from Well 2 (WASH 62373).

Due to their close proximity, the two wells produce water from shared water-bearing zones. Any pump test on one well requires the other to remain off for an extended period.

A 47-hour 465 gallon per minute (gpm) constant-rate pump test was performed on Well 2 (WASH 62373). The results of this pump test on are on file with OWRD.

In lieu of idling Well 2 for a pump test on Well 1, the results of Well 2's pump test are respectfully submitted as a better overall representation of the characteristics of the basalt aquifer in this area.

I hereby certify that the well(s) requested for exemption(s) are under my ownership.

SIGNATURE: RG CWRE DATE: 3/29/2021

Robert E. Long Jr.

The original and first copy of this report are to be filed with the WATER RESOURCES DEPARTMENT, SALEM, OREGON 97310 within 30 days from the date of well completion.

WATER WELL REPORT
STATE OF OREGON
(Please type or print)

RECEIVED
SEP - 6 1977
(Do not write above this line)

WASH 7651

State Well No. 2N/3W-31

State Permit No. _____

(1) OWNER: WATER RESOURCES DEPT. SALEM, OREGON

Name City of Banks

Address Banks, Oregon

(2) TYPE OF WORK (check):

New Well ☒ Deepening ☐ Reconditioning ☐ Abandon ☐

If abandonment, describe material and procedure in Item 12.

(3) TYPE OF WELL:

Rotary ☒ Driven ☐
Cable ☐ Jetted ☐
Dug ☐ Bored ☐

(4) PROPOSED USE (check):

Domestic ☐ Industrial ☐ Municipal ☒
Irrigation ☐ Test Well ☐ Other ☐

(5) CASING INSTALLED: Threaded ☐ Welded ☒

8-5/8 " Diam. from plus 2 ft. to 210 ft. Gage .250

_____ " Diam. from _____ ft. to _____ ft. Gage _____

_____ " Diam. from _____ ft. to _____ ft. Gage _____

(6) PERFORATIONS: Perforated? ☐ Yes ☒ No.

Type of perforator used

Size of perforations in. by in.

_____ perforations from _____ ft. to _____ ft.

_____ perforations from _____ ft. to _____ ft.

_____ perforations from _____ ft. to _____ ft.

(7) SCREENS: Well screen installed? ☐ Yes ☒ No

Manufacturer's Name

Type Model No.

Diam. Slot size Set from ft. to ft.

Diam. Slot size Set from ft. to ft.

(8) WELL TESTS: Drawdown is amount water level is lowered below static level

Was a pump test made? ☒ Yes ☐ No If yes, by whom? AMJannsen

Yield: 275 gal./min. with 224 ft. drawdown after 48 hrs.

" 150 " 146 " "

" " " "

Bailer test gal./min. with ft. drawdown after hrs.

Artesian flow g.p.m.

Temperature of water 58° Depth artesian flow encountered ft.

(9) CONSTRUCTION:

Well seal—Material used Cement grout & 2% gel

Well sealed from land surface to 210 ft.

Diameter of well bore to bottom of seal 12-1/4" in.

Diameter of well bore below seal 8" in.

Number of sacks of cement used in well seal 25 sacks

How was cement grout placed? Placed on o.d. of casing & through grout pipe - 20 sacks run @ 210', 5 sacks run to top off at ground level upon completion

Was a drive shoe used? ☐ Yes ☒ No Plugs Size: location ft.

Did any strata contain unusable water? ☒ Yes ☐ No

Type of water? insufficient depth of strata 130' to 160'

Method of sealing strata off cased and cemented

Was well gravel packed? ☐ Yes ☒ No Size of gravel:

Gravel placed from ft. to ft.

(10) LOCATION OF WELL:

County Washington Driller's well number

¼ ¼ Section 31 T. 2 N R. 3 W. W.M.

Bearing and distance from section or subdivision corner

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(11) WATER LEVEL: Completed well.

Depth at which water was first found 130 ft.

Static level 84 ft. below land surface. Date 8/24/77

Artesian pressure lbs. per square inch. Date

(12) WELL LOG: Diameter of well below casing 8"

Depth drilled 450 ft. Depth of completed well 450 ft.

Formation: Describe color, texture, grain size and structure of materials; and show thickness and nature of each stratum and aquifer penetrated, with at least one entry for each change of formation. Report each change in position of Static Water Level and indicate principal water-bearing strata.

MATERIAL	From	To	SWL
Dark brown clay topsoil	0	8	
Silty brown clay	8	15	
Red-brown clay w/rotten rock fragments	15	50	
Sticky red clay-occ. rotten rock streaks	50	95	
Brown clay & rotten rock	95	110	
Dark brown & gray-brown clay --organic material	110	120	
Soft blue-gray cemented gravel	120	130	
Rotten brown basalt	130	160	20 gpm
Soft brown basalt-occ.weathered	160	195	
Black-brown basalt	195	215	
Hard gray-black basalt	215	230	
Broken brown basalt w/soapstone and lava interbeds	230	245	10 gpm
Fractured black basalt--occ. crevice	245	265	
Hard gray-black basalt, occ-			

Work started 8/16/77 19 Completed 8/24/77 19

Date well drilling machine moved off of well 8/24/77 19

Drilling Machine Operator's Certification:

This well was constructed under my direct supervision. Materials used and information reported above are true to my best knowledge and belief.

[Signed] _____ (Drilling Machine Operator) Date 8/29/77, 19

Drilling Machine Operator's License No. 523

Water Well Contractor's Certification:

This well was drilled under my jurisdiction and this report is true to the best of my knowledge and belief.

Name A. M. Jannsen Drilling Co. (Person, firm or corporation) (Type or print)

Address 21075 SW Tualatin Valley Hwy. Aloha, Oreg

[Signed] Edward M Jannsen (Water Well Contractor)

Contractor's License No. 79 Date 8/29/77, 19

(USE ADDITIONAL SHEETS IF NECESSARY)

SP*45656-110

NOTICE TO WATER WELL CONTRACTOR
The original and first copy of this report are to be filed with the WATER RESOURCES DEPARTMENT, SALEM, OREGON 97310 within 30 days from the date of well completion.

RECEIVED
SEP - 6 1977
WATER RESOURCES DEPT.
SALEM, OREGON

WATER WELL REPORT
STATE OF OREGON
(Please type or print)
(Do not write above this line)

State Well No. 2N/3W-31

State Permit No. _____

Page 2

(1) OWNER:
Name City of Banks
Address

(2) TYPE OF WORK (check):
New Well ☐ Deepening ☐ Reconditioning ☐ Abandon ☐
If abandonment, describe material and procedure in Item 12.

(3) TYPE OF WELL:
Rotary ☐ Driven ☐
Cable ☐ Jetted ☐
Dug ☐ Bored ☐

(4) PROPOSED USE (check):
Domestic ☐ Industrial ☐ Municipal ☐
Irrigation ☐ Test Well ☐ Other ☐

(5) CASING INSTALLED:
Threaded ☐ Welded ☐
_____" Diam. from _____ ft. to _____ ft. Gage _____
_____" Diam. from _____ ft. to _____ ft. Gage _____
_____" Diam. from _____ ft. to _____ ft. Gage _____

(6) PERFORATIONS:
Perforated? ☐ Yes ☐ No.
Type of perforator used
Size of perforations _____ in. by _____ in.
_____ perforations from _____ ft. to _____ ft.
_____ perforations from _____ ft. to _____ ft.
_____ perforations from _____ ft. to _____ ft.

(7) SCREENS:
Well screen installed? ☐ Yes ☐ No
Manufacturer's Name
Type _____ Model No. _____
Diam. _____ Slot size _____ Set from _____ ft. to _____ ft.
Diam. _____ Slot size _____ Set from _____ ft. to _____ ft.

(8) WELL TESTS:
Drawdown is amount water level is lowered below static level
Was a pump test made? ☐ Yes ☐ No If yes, by whom?
Yield: _____ gal./min. with _____ ft. drawdown after _____ hrs.
" " " "
" " " "
Bailer test _____ gal./min. with _____ ft. drawdown after _____ hrs.
Artesian flow _____ g.p.m.
Temperature of water Depth artesian flow encountered _____ ft.

(9) CONSTRUCTION:
Well seal—Material used
Well sealed from land surface to _____ ft.
Diameter of well bore to bottom of seal _____ in.
Diameter of well bore below seal _____ in.
Number of sacks of cement used in well seal _____ sacks
How was cement grout placed?
Was a drive shoe used? ☐ Yes ☐ No Plugs _____ Size: location _____ ft.
Did any strata contain unusable water? ☐ Yes ☐ No
Type of water? _____ depth of strata
Method of sealing strata off
Was well gravel packed? ☐ Yes ☐ No Size of gravel: _____
Gravel placed from _____ ft. to _____ ft.

(10) LOCATION OF WELL:
County _____ Driller's well number _____
¼ ¼ Section T. R. W.M.
Bearing and distance from section or subdivision corner

(11) WATER LEVEL: Completed well.
Depth at which water was first found _____ ft.
Static level _____ ft. below land surface. Date _____
Artesian pressure _____ lbs. per square inch. Date _____

(12) WELL LOG:
Diameter of well below casing _____
Depth drilled _____ ft. Depth of completed well _____ ft.

Formation: Describe color, texture, grain size and structure of materials; and show thickness and nature of each stratum and aquifer penetrated, with at least one entry for each change of formation. Report each change in position of Static Water Level and indicate principal water-bearing strata.

MATERIAL	From	To	SWL
fracture	265	315	5 gpm
Brown basalt-occ.broken	315	325	10 gpm
Hard black & gray-black basalt-occ. crevice	325	360	
Black basalt--occ. broken w/ green soapstone	360	380	25 gpm
Broken black & brown basalt- w/ lava & soapstone interbed	380	400	200 gpm
Broken gray-brown basalt w/ lava streaks	400	415	100gpm
Hard gray-black basalt--occ. crevice	415	450	

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Work started 19 Completed 19
Date well drilling machine moved off of well 19

Drilling Machine Operator's Certification:
This well was constructed under my direct supervision. Materials used and information reported above are true to my best knowledge and belief.

[Signed] _____ Date _____, 19____
(Drilling Machine Operator)
Drilling Machine Operator's License No. _____

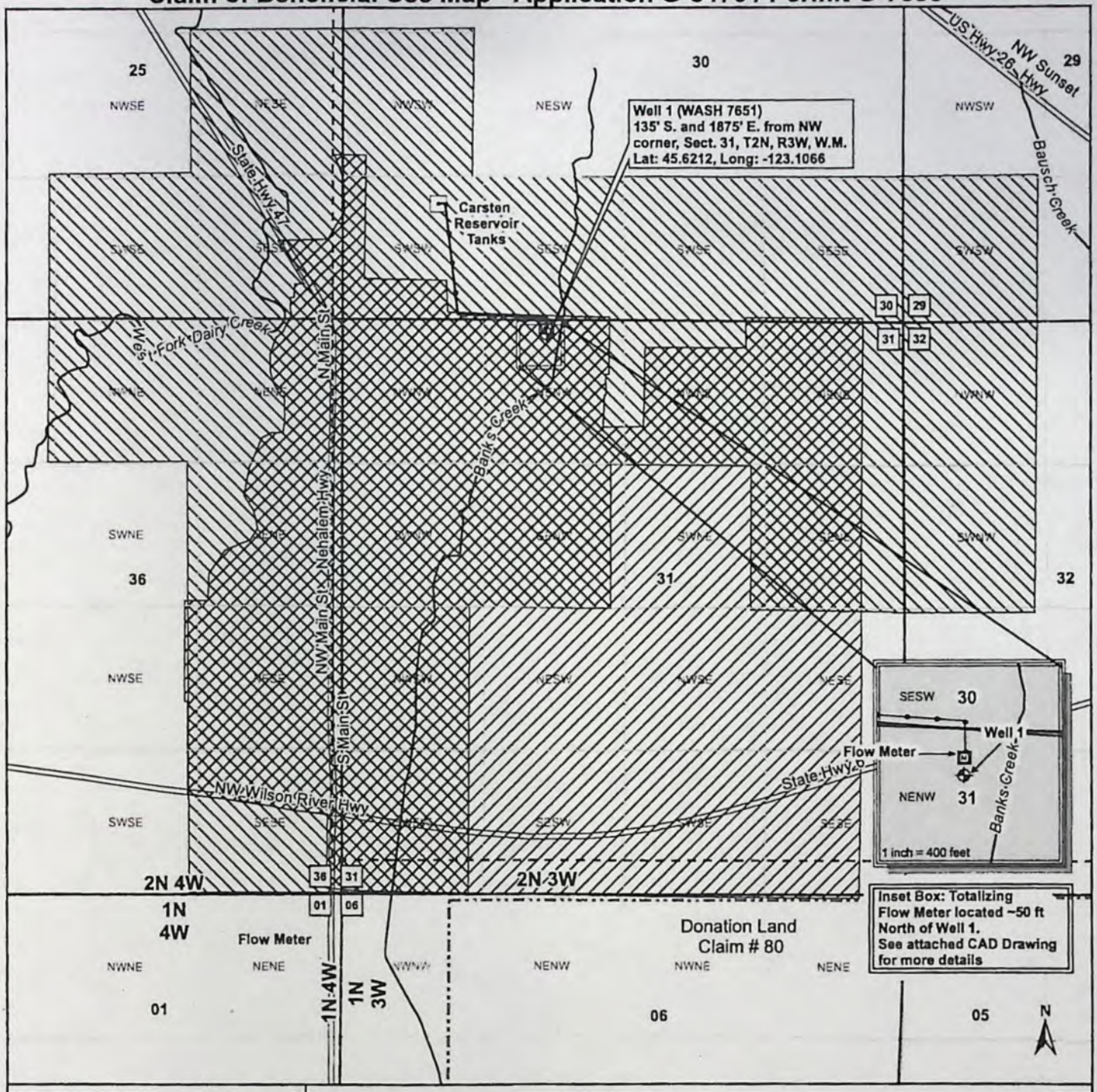
Water Well Contractor's Certification:
This well was drilled under my jurisdiction and this report is true to the best of my knowledge and belief.

Name _____
(Person, firm or corporation) (Type or print)
Address _____
[Signed] _____
(Water Well Contractor)
Contractor's License No. _____ Date _____, 19____

(USE ADDITIONAL SHEETS IF NECESSARY)

SP*45656-119

Claim of Beneficial Use Map - Application G-8476 / Permit G-7593



City of Banks
Well 1 (WASH 7651)
Application; G-8476
Permit: G-7593

T. 2N., R. 3W. W.M. Sect. 29, 30, 31, 32
T. 2N., R. 4W. W.M. Sect. 25 and 36

Legend

- Well 1 (WASH 7651)
- Magnetic Flow Meter in Vault
- Carsten Reservoir Tanks
- Water line (6" pvc)
- Streams
- Highways
- Place of Use per Permit 7593
- Banks Service Area per UGB
- Donation Land Claim
- Township/Range
- 31 Sections
- NENW 1/4, 1/4 Sections

BANKS
13680 NW Main Street
Banks, Oregon 97106

CWRE SEAL:

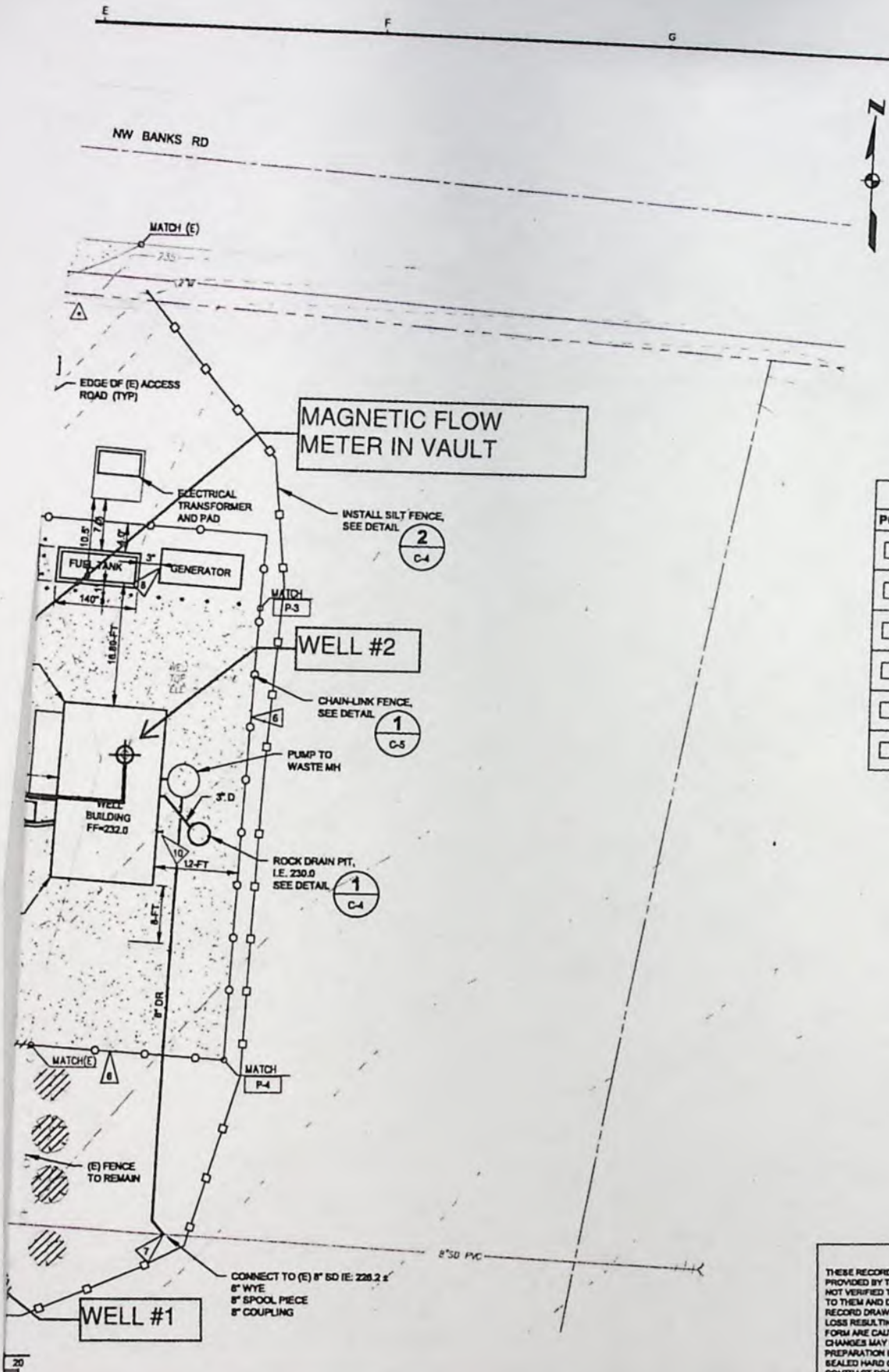
CwM-H2O
Complete Water Management
1319 SE MLK JR BLVD #204
Portland, OR 97214

0 660 1,320 FT

1 inch = 1,320 ft

This map is not intended to provide legal dimensions or property ownership lines.

C:\01 Projects\11501004 Water Supply Development\6. Applications\CBU\Well 1\Banks_CBU_WASH7651_17Mar2020.pdf JST



NOTES:

1. EXISTING RESERVOIR LEVEL TELEMETRY FROM CARSTEN RESERVOIRS 1 AND 2.
2. EXISTING 8-INCH DRAIN LINE FROM CARSTEN RESERVOIRS.
3. EXISTING 6-INCH WATER LINE TO BE ABANDONED IN-PLACE. REMOVE AS NEEDED TO MAKE NEW CONNECTIONS, THEN PLUG AND CAP ENDS.
4. REMOVE EXISTING FENCE AND GATE.
5. REMOVE EXISTING SHRUBS.
6. RESTORE ACCESS ROAD AND AREA INSIDE OF FENCE WITH 6" OF COMPACTED CRUSHED ROCK. SEE DETAIL 4/C4.
7. POTHOLE TO DETERMINE UTILITY LOCATION AND INVERT ELEVATION.
8. WELL SITE GENERATOR, PAD AND ASSOCIATED CIVIL WORK PART OF ADDITIVE ALTERNATE 2. FOR SLAB, SEE DETAIL 4/ S-2
9. SEE SECTION 01010 FOR SEQUENCE OF CONSTRUCTION.
10. UTILITY WATER STATION

LAYOUT CORRDINATE TABLE

POINT #	NORTHING	EASTING	DESCRIPTION
P-1	N 723408.78	E 7535319.82	NW CORNER OF BLDG
P-2	N 723384.84	E 7535318.09	SW CORNER OF BLDG
P-3	N 723422.05	E 7535347.19	NE CORNER OF FENCE
P-4	N 723359.97	E 7535343.21	SE CORNER OF FENCE
P-5	N 723365.06	E 7535266.45	SW CORNER OF FENCE
P-6	N 723426.97	E 7535270.42	NW CORNER OF FENCE

RECORD DRAWINGS

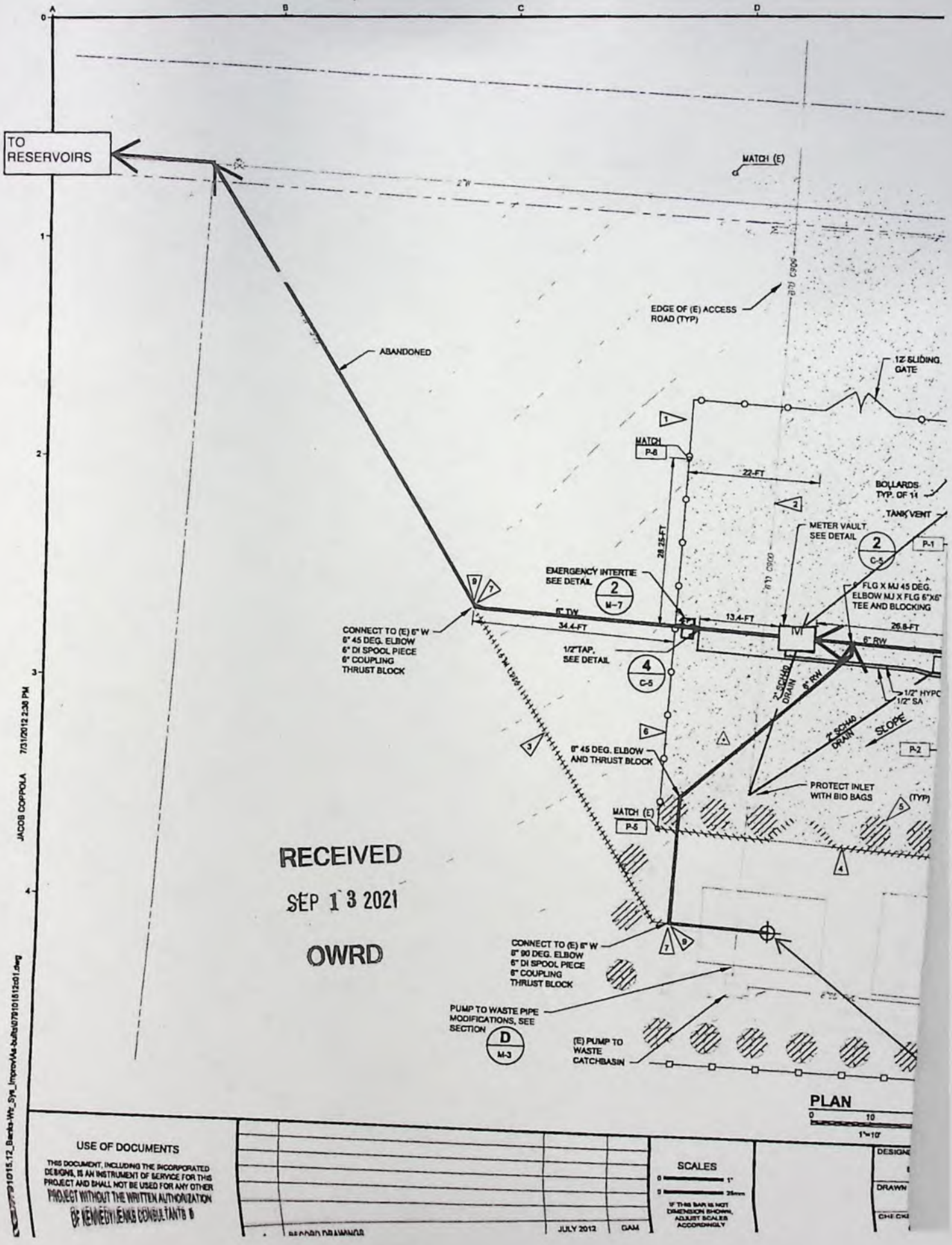
THESE RECORD DRAWINGS HAVE BEEN PREPARED BASED ON INFORMATION PROVIDED BY THE CONTRACTOR AND OTHERS. KENNEDY/JENKS CONSULTANTS HAS NOT VERIFIED THE ACCURACY OR COMPLETENESS OF THE INFORMATION PROVIDED TO THEM AND DOES NOT WARRANT THE ACCURACY OR COMPLETENESS OF THESE RECORD DRAWINGS. USERS OF THESE RECORD DRAWINGS ASSUME ALL RISK OF LOSS RESULTING FROM THEIR USE. USERS OF THESE DOCUMENTS IN ELECTRONIC FORM ARE CAUTIONED AGAINST USE WITHOUT FIRST DETERMINING WHETHER CHANGES MAY HAVE BEEN MADE TO THESE DOCUMENTS SUBSEQUENT TO THEIR PREPARATION BY KENNEDY/JENKS CONSULTANTS. ORIGINALS OF SIGNED AND SEALED HARD COPIES OF THESE DOCUMENTS ARE THE ONLY TRUE RECORD OF TH CONTRACT DOCUMENTS PREPARED BY KENNEDY/JENKS CONSULTANTS.

CITY OF BANKS
WASHINGTON COUNTY, OREGON
WATER SYSTEM IMPROVEMENTS PROJECT

Kennedy/Jenks Consultants
[illegible] W. MARKET, SUITE 500, PORTLAND OREGON 97201

BEHRMAN WELLS
SITE PIPING AND GRADING

FILE NAME 079101512C01.I
JOB NO. 0791015.1
DATE MARCH 20
SHEET **C-1**


TO RESERVOIRS
MATCH (E)
EDGE OF (E) ACCESS ROAD (TYP)
ABANDONED
12' SLIDING GATE
MATCH P-8
22-FT
BOLLARDS TYP. OF 11
TANK VENT
METER VAULT SEE DETAIL 2 C-5
P-1
28.25-FT
EMERGENCY INTERTIE SEE DETAIL 2 M-7
6" FLG X MJ 45 DEG. ELBOW MJ X FLG 6"X6" TEE AND BLOCKING
6" DW
34.4-FT
13.4-FT
26.8-FT
6" RW
CONNECT TO (E) 6" W 6" 45 DEG. ELBOW 6" DI SPOOL PIECE 6" COUPLING THRUST BLOCK
1/2" TAP, SEE DETAIL 4 C-5
2" SCH40 DRAIN
1/2" HYPO
1/2" SA
SLOPE
P-2
8" 45 DEG. ELBOW AND THRUST BLOCK
PROTECT INLET WITH BIO BAGS (TYP)
MATCH (E) P-5
CONNECT TO (E) 6" W 6" 90 DEG. ELBOW 6" DI SPOOL PIECE 6" COUPLING THRUST BLOCK
PUMP TO WASTE PIPE MODIFICATIONS, SEE SECTION D M-3
(E) PUMP TO WASTE CATCHBASIN
PLAN
0 10
1"=10'
RECEIVED
SEP 13 2021
OWRD
USE OF DOCUMENTS
THIS DOCUMENT, INCLUDING THE INCORPORATED DESIGNS, IS AN INSTRUMENT OF SERVICE FOR THIS PROJECT AND SHALL NOT BE USED FOR ANY OTHER PROJECT WITHOUT THE WRITTEN AUTHORIZATION OF KENNEDY/JENKS CONSULTANTS
SCALES
IF THIS BAR IS NOT DIMENSION SHOWN, ADJUST SCALES ACCORDINGLY
JULY 2012
GAM
DESIGN
DRAWN
CHECKED
JACOB COPPOLA 7/31/2012 2:30 PM
21015.12_Banks-Wtr_Sys_Improv\As-builts\07910151212c01.dwg

KAVANAGH Kerry L * WRD

From: Bob Long <Bob.Long@cwmh2o.com>
Sent: Friday, February 11, 2022 8:33 AM
To: KAVANAGH Kerry L * WRD
Subject: RE: NEED: demonstration of use for municipal use - Certificate RA Project R12827-23 for City of Banks involving Application G-8476

Kerry-

The City would like to withdraw the Claim of Beneficial Use at this time. Thank you. - B

Bob Long, RG, LHG, CWRE | Principal Consultant
www.CwMH2O.com | Cell (503) 799-0304

From: KAVANAGH Kerry L * WRD <Kerry.L.KAVANAGH@water.oregon.gov>
Sent: Friday, February 4, 2022 1:09 PM
To: Bob Long <Bob.Long@cwmh2o.com>
Cc: KAVANAGH Kerry L * WRD <Kerry.L.KAVANAGH@water.oregon.gov>
Subject: NEED: demonstration of use for municipal use - Certificate RA Project R12827-23 for City of Banks involving Application G-8476

Hello Bob,

During our telephone conference on January 20, 2022, I believe that you had mentioned you would be meeting with City officials on or about January 27, 2022.

I am following up on the demonstration of beneficial use. Any new information to share?

Thank you,
Kerry

Kerry Kavanagh
Certificate Reimbursement Authority Program Coordinator
Certificate Section, Water Rights Services Division
725 Summer St NE Suite A | Salem OR 97301 | Direct 503.979.3208
kerry.l.kavanagh@water.oregon.gov| https://www.oregon.gov/OWRD

OREGON
WATER
RESOURCES
DEPARTMENT

Integrity | Service | Technical Excellence | Teamwork | Forward-Looking

Oregon
Kate Brown, Governor

Water Resources Department
725 Summer St NE, Suite A
Salem, OR 97301
(503) 986-0900
Fax (503) 986-0904

September 15, 2021

City of Banks
13680 NW Main St
Banks OR 97106

On September 13, 2021 the Water Resources Department received the Claim of Beneficial Use (COBU) for the following file(s):

Application G-8476 G-7593

The COBU included a report and map. The Department hopes to review your submittal within approximately 2 - 4 years. At that time, we will review these items and provide a final certificate, proposed certificate, or a request for additional information.

If you are interested in having your COBU reviewed sooner, you may pay to have your file processed immediately, using the Reimbursement Authority program, which is described at:

https://www.oregon.gov/OWRD/programs/WaterRights/RA/Pages/Certificate.aspx

Customer Service phone: (503) 986-0900

Enclosed is your receipt for the $230.00 COBU recording fee

If you sell the property, please contact the Department, or have the new owners contact the Department about the need to file an assignment.

Cc: file G-8476
Robert Long, CWRE

STATE OF OREGON
WATER RESOURCES DEPARTMENT

RECEIPT # 136395

725 Summer St. N.E. Ste. A
SALEM, OR 97301-4172
(503) 986-0900 / (503) 986-0904 (fax)

INVOICE # _____

RECEIVED FROM: City of Banks
BY: _____

APPLICATION	G-8476
PERMIT	
TRANSFER	

CASH: ☐ CHECK:# ☒ 24212 OTHER: (IDENTIFY) ☐ _____

TOTAL REC'D $ 230.00

1083 TREASURY 4170 WRD MISC CASH ACCT

0407	COPIES		$
_____	OTHER: (IDENTIFY)	_____	$

0243 I/S Lease _____ 0244 Muni Water Mgmt. Plan _____ 0245 Cons. Water _____

4270 WRD OPERATING ACCT

MISCELLANEOUS 46111

0407	COPY & TAPE FEES		$
0410	RESEARCH FEES		$
0408	MISC REVENUE: (IDENTIFY)	_____	$
TC162	DEPOSIT LIAB. (IDENTIFY)	_____	$
0240	EXTENSION OF TIME		$

WATER RIGHTS:

		EXAM FEE		RECORD FEE
0201	SURFACE WATER	$	0202	$
0203	GROUND WATER	$	0204	$
0205	TRANSFER	$		

WELL CONSTRUCTION

		EXAM FEE		LICENSE FEE
0218	WELL DRILL CONSTRUCTOR	$	0219	$
	LANDOWNER'S PERMIT		0220	$

0200 OTHER (IDENTIFY) COBU $230.00

0536 TREASURY 0437 WELL CONST. START FEE

0211	WELL CONST START FEE	$	CARD#	
0210	MONITORING WELLS	$	CARD#	

_____ OTHER (IDENTIFY) _____

0607 TREASURY 0467 HYDRO ACTIVITY LIC NUMBER

0233	POWER LICENSE FEE (FW/WRD)		$
0231	HYDRO LICENSE FEE (FW/WRD)		$
_____	HYDRO APPLICATION		$

_____ TREASURY OTHER / RDX

FUND _____ TITLE _____
OBJ. CODE _____ VENDOR # _____
DESCRIPTION _____ $

RECEIPT: 136395 DATED: 9-13-2021 BY: Mindy Cadsm

Distribution – White Copy - Customer, Yellow Copy - Fiscal, Blue Copy - File, Buff Copy - Fiscal

Checklist for Claims of Beneficial Use Received at CSG Counter

Application #: G-8476	WRD Reviewer: Judy
Transfer #:	
Date Received: 09/13/2021	
CWRE Name: Robert Long	
Priority Date (s): 09/29/1977	

Fees Required:

☑ YES NO ☐ A fee of $230 must accompany this form for permits with priority dates of July 9, 1987, or later.

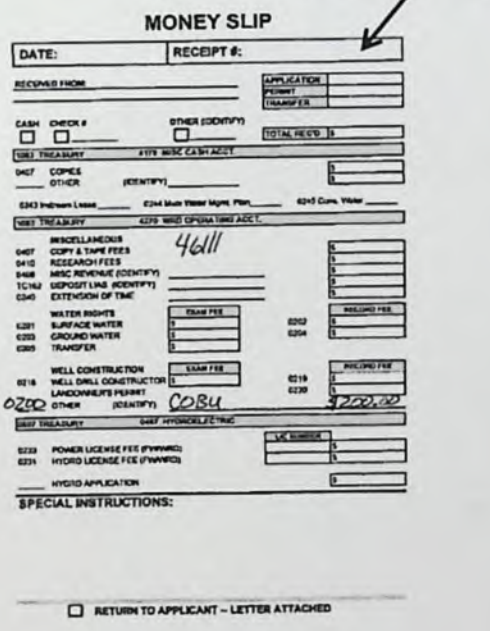
☐ YES NO ☐ A fee of $230 must accompany this form for any transfers including a water right with a priority date of July 9, 1987, or later.

Example – A transfer involves 5 rights and one of the rights has a priority date of July 9, 1987, or later, the fee is required.

Fill in App or Transfer Number

Map Review:

- ☑ Map on polyester film (OAR 690-014-0170(1) & 310-0050(1)(b))
- ☑ Application & permit #; or transfer # (OAR 690-014-0100(1))
- ☑ Disclaimer (OAR 690-014-0170(5))
- ☑ North arrow (OAR 690-310-0050(2)(c))
- ☑ CWRE stamp and signature (OAR 690-014 & 310-0050)
- ☑ Appropriate scale (1" = 1320', 1" = 400', or the original full-size scale of the county assessor map) (014 & 310)
- ☑ Township, range, section, and tax lot numbers (OAR 690-310-0050(4))


MONEY SLIP

DATE: RECEIPT #:

RECEIVED FROM:

APPLICATION
PERMIT
TRANSFER

CASH CHECK # OTHER (IDENTIFY) TOTAL RECD $

1081 TREASURY #179 MISC CASH ACCT

0407 COPIES
OTHER (IDENTIFY)

0343 Instream Lease 0344 Multi Water Mgmt. Plan 0345 Conv. Water

1081 TREASURY 4279 WRD OPERATING ACCT.

MISCELLANEOUS 4611
0407 COPY & TAPE FEES
0410 RESEARCH FEES
0469 MISC REVENUE (IDENTIFY)
TC1462 DEPOSIT/LNS (IDENTIFY)
0340 EXTENSION OF TIME

EXAM FEE INVOICED FEE

WATER RIGHTS
0281 SURFACE WATER 0252
0283 GROUND WATER 0254
0285 TRANSFER

EXAM FEE INVOICED FEE

WELL CONSTRUCTION
0216 WELL DRILL CONSTRUCTOR 0219
LANDOWNER'S PERMIT 0220
0200 OTHER (IDENTIFY) COBU 2200.00

0487 TREASURY 0487 HYDROELECTRIC

LIC NUMBER

0233 POWER LICENSE FEE (FWWRD)
0234 HYDRO LICENSE FEE (FWWRD)

HYDRO APPLICATION

SPECIAL INSTRUCTIONS:

☐ RETURN TO APPLICANT – LETTER ATTACHED

Report Review:

- ☑ On form provided by the Department (OAR 690-014-0100(1))
- ☑ Application & permit #; or transfer # (OAR 690-014)
- ☑ Ownership information (OAR 690-014)
- ☑ Date of survey (OAR 690-014)
- ☑ Person interviewed (OAR 690-014)
- ☑ County (OAR 690-014)
- ☑ CWRE stamp and signature (OAR 690-014-0100)
- ☑ Signature(s) of all permittee of transfer holder (OAR 690-014-0100)

Groundwater File Review:

- ☐ Pump Test not required (Priority Date prior to December 20, 1988) *If no, include pump test flyer w/acknowledgment letter
- ☑ Pump Test required (Priority Date on or after December 20, 1988)
- ☐ Pump Test submitted
- ☑ Pump Test not submitted

CITY OF BANKS

24212

Oregon Water Resource Dept

9/2/2021

Date	Type	Reference	Original Amt.	Balance Due	Discount	Payment
9/1/2021	Bill		230.00	230.00		230.00
					Check Amount	230.00

RECEIVED
SEP 13 2021
OWRD

Checking Claim of Beneficial Use - Permit G-7593, Well 1 230.00

PIERCEALL Jeffrey D * WRD

From: COPE Kerri H * WRD
Sent: Friday, July 17, 2020 11:05 AM
To: PIERCEALL Jeffrey D * WRD
Cc: JARAMILLO Lisa J * WRD
Subject: RE: Final Order Approving Extension of Time for Permit G-7593

Thanks Jeffrey for taking care of this so quickly!

Kerri H. Cope | Water Management and Conservation Analyst/Reuse Coordinator
Water Resources Department | 725 Summer St. NE, Suite A | Salem, Oregon 97301
Ph: 503 986-0919 | Fax: 503 986-0901
Email: Kerri.H.Cope@oregon.gov | Web:http://www.oregon.gov

From: PIERCEALL Jeffrey D * WRD <Jeffrey.D.Pierceall@oregon.gov>
Sent: Friday, July 17, 2020 10:57 AM
To: KAVANAGH Kerry L * WRD <Kerry.L.Kavanagh@oregon.gov>; COPE Kerri H * WRD <Kerri.H.Cope@oregon.gov>; r.harman@water-law.com; j.wiley@water-law.com
Cc: CLARK Gerald E * WRD <Gerald.E.Clark@oregon.gov>
Subject: RE: Final Order Approving Extension of Time for Permit G-7593

Rachelq,
Thank you for the email. I have reviewed the documents, and they are not in error.

The City submitted an Application for Extension of Time which claimed that 0.613 cfs had been diverted prior to the most recent completion date, being October 1, 2017. ORS 537.630 requires that the Department place a development limitation on extensions of time for municipal water users based on the rate of water diverted prior to the completion date of the permit. Because the Application for Extension of Time identified that only 0.613 cfs had been diverted, the development limitation must reflect that diversion rate. The Extension Final Order and the associated development limitation supersedes any previous order granting access to the remaining portion of the permit until a new WMCP is submitted with a request for the use of the additional water, and that request is approved.

Jeffrey D. Pierceall
Extension Specialist
Oregon Water Resources Department
503-986-0802
Jeffrey.D.Pierceall@oregon.gov

From: KAVANAGH Kerry L * WRD <Kerry.L.Kavanagh@oregon.gov>
Sent: Friday, July 17, 2020 10:44 AM
To: PIERCEALL Jeffrey D * WRD <Jeffrey.D.Pierceall@oregon.gov>; COPE Kerri H * WRD <Kerri.H.Cope@oregon.gov>
Cc: CLARK Gerald E * WRD <Gerald.E.Clark@oregon.gov>; KAVANAGH Kerry L * WRD <Kerry.L.Kavanagh@oregon.gov>
Subject: FW: Final Order Approving Extension of Time for Permit G-7593

Hello Jeffrey and Kerri,

This email was sent to my attention today.

I am hoping that one of you can address this matter.

Thank you,
Kerry

Kerry Kavanagh
Certificate Reimbursement Authority Program Coordinator
Certificate Section, Water Rights Services Division
725 Summer St NE Suite A | Salem OR 97301 | 503.986.0927
kerry.l.kavanagh@oregon.gov| https://www.oregon.gov/OWRD

OREGON
WATER
RESOURCES
DEPARTMENT

Integrity | Service | Technical Excellence | Teamwork | Forward-Looking

---

From: Rachelq Harman <r.harman@water-law.com>
Sent: Friday, July 17, 2020 9:51 AM
To: KAVANAGH Kerry L * WRD <Kerry.L.Kavanagh@oregon.gov>
Cc: Jakob Wiley <j.wiley@water-law.com>
Subject: Final Order Approving Extension of Time for Permit G-7593

Dear Mr. Kavanagh:

Attached please find a letter from our office with enclosures. A hard copy will follow via US mail. Please contact us if there is any difficulty opening the attachment.

Regards,
Rachelq

Rachelq Harman
Paralegal
Schroeder Law Offices, P.C.
1915 NE Cesar E Chavez Blvd. Portland, OR 97212
P: (503) 281-4100| F: (877) 600-4971

SCHROEDER
LAW OFFICES, P.C.

Join our mailing list!

Laura A. Schroeder
Oregon, Idaho,
Nevada, Washington & Utah

Therese A. Ure
Oregon & Nevada

Sarah R. Liljefelt
Oregon,
California & Utah

SCHROEDER
LAW OFFICES, P.C.

William F. Schroeder
(1928 - 2015)

Wyatt E. Rolfe
Of Counsel
Oregon & Washington

James Browitt
Of Counsel
Idaho & Washington

July 17, 2020

VIA U.S. AND ELECTRONIC MAIL

Oregon Water Resources Department
Attn: Kerry Kavanagh
725 Summer St. NE, Suite A
Salem, OR 97301
Email: kerry.l.kavanagh@oregon.gov

RE: Final Order Approving Extension of Time for Permit G-7593

Dear Mr. Kavanagh:

We are sending you this letter because you are indicated as the case worker for Permit G-7593 on the Oregon Water Resources Department ("OWRD") website. We would appreciate your forward to a different caseworker if this is not a matter that is appropriate for your resolution.

We represent the City of Banks, Oregon ("City") for water-related matters. Recently we became aware of an error in Final Order 107-308 (attached as Exhibit 1 to this letter). On August 10, 2010, OWRD issued Final Order 81-661 (attached as Exhibit 2 to this letter) which provides that the City may develop up to "up to 0.67 cfs under Permit G-7593." On January 1, 2018, OWRD issued Final Order 107-309, which states "[a] maximum appropriation of 0.613 cfs of water is currently allowed under Permit G-7593. Any appropriation of water beyond 0.613 cfs . . . shall only be authorized upon issuance of a final order approving a Water Management and conservation Plan . . ."

The rate limitation condition stated in Final Order 107-309 appears to be a "typographical" error. We would request OWRD issue a correcting final order to correct the inconsistency we have described above.

Very truly yours,
SCHROEDER LAW OFFICES, P.C.

Laura A. Schroeder

LAS:jsw
Enclosures
cc: Client
Bob Long *(via email)*

EXHIBIT 1

Oregon Water Resources Department
Water Right Services Division

In the Matter of the Application for an Extension of Time for Permit G-7593, Water Right Application G-8476, in the name of the City of Banks	)))	**FINAL ORDER**

Permit Information

Application File G-8476/ Permit G-7593
Basin 2C – Lower Willamette Basin / Watermaster District 18
Date of Priority: September 29, 1977

Authorized Use of Water

Source of Water:	A well in West Fork Dairy Creek Basin
Purpose or Use:	Municipal
Maximum Rate:	0.67 Cubic Foot per Second (CFS)

This Extension of Time request is being processed in accordance with Oregon Revised Statute 537.630 and 539.010(5), and Oregon Administrative Rule Chapter 690, Division 315.

Appeal Rights
This final order is subject to judicial review by the Court of Appeals under ORS 183.482. Any petition for judicial review must be filed within the 60-day time period specified by ORS 183.482(1). Pursuant to ORS 536.075 and OAR 137-003-0675, you may petition for judicial review or petition the Director for reconsideration of this order. A petition for reconsideration may be granted or denied by the Director, and if no action is taken within 60 days following the date the petition was filed, the petition shall be deemed denied.

Application History
Permit G-7593 was issued by the Department on December 12, 1977. The permit specified that construction of the water development project was to begin on or before December 2, 1978, construction was to be completed on or before October 1, 1979, and the complete application of water was to be made on or before October 1, 1980. The most recent extension authorized completion of construction and complete application of water to beneficial use by October 1, 2017. On October 2, 2017, the City of Banks submitted an application for an extension of time for Permit G-7593. In accordance with OAR 690-315-0050(2), on November 14, 2017, the Department issued a Proposed Final Order proposing to extend the time to complete construction to October 1, 2027, and to extend the time to fully apply water to beneficial use to October 1, 2027. The protest period closed December 29, 2017, in accordance with OAR 690-315-0060(1). No protest was filed.

EXHIBIT 1

FINDINGS OF FACT

The Department adopts and incorporates by reference the findings of fact in the Proposed Final Order dated November 14, 2017.

At time of issuance of the Proposed Final Order the Department concluded that, based on the factors demonstrated by the applicant, the permit may be extended subject to the following condition:

CONDITIONS

1. **Development Limitations**
   A maximum appropriation of 0.613 cfs of water is currently allowed under Permit G-7593. Any appropriation of water beyond 0.613 cfs (not to exceed the maximum amount authorized under the permit, being 0.67 cfs) shall only be authorized upon issuance of a final order approving a Water Management and Conservation Plan (WMCP) under OAR Chapter 690, Division 86 that authorizes access to a greater rate of appropriation of water under the permit consistent with OAR 690-086-0130(7). The required WMCP shall be submitted to the Department within 3 years of this Final Order. The amount of water used under Permit G-7593 must be consistent with this and subsequent WMCP's approved under OAR Chapter 690, Division 86 on file with the Department.

   The Development Limitation established in the above paragraph supersedes any prior limitation of the appropriation of water under Permit G-7593 that has been established under a prior WMCP or Extension final order issued by the Department.

   The deadline established in the Extension Final Order for submittal of a WMCP shall not relieve a permit holder of any existing or future requirement for submittal of a WMCP at an earlier date as established through other orders of the Department. A WMCP submitted to meet the requirements of the final order may also meet the WMCP submittal requirements of other Department orders.

CONCLUSION OF LAW

The applicant has demonstrated good cause for the permit extension pursuant to ORS 537.630, 539.010(5) and OAR 690-315-0080(3).

EXHIBIT 1

ORDER

The extension of time for Application G-8476, Permit G-7593, therefore, is approved subject to conditions contained herein. The deadline for completing construction is extended from October 1, 2017, to October 1, 2027. The deadline for applying water to full beneficial use within the terms and conditions of the permit is extended from October 1, 2017, to October 1, 2027.

DATED: January 5, 2018

Dwight French
Water Right Services Division Administrator, for
Thomas M. Byler, Director
Oregon Water Resources Department

If you have any questions about statements contained in this document, please contact Jeffrey Pierceall at 503-986-0802.

If you have other questions about the Department or any of its programs, please contact our Water Resources Customer Service Group at (503) 986-0900.

EXHIBIT 2

BEFORE THE WATER RESOURCES DEPARTMENT
OF THE
STATE OF OREGON

In the Matter of the Proposed Water Management and Conservation Plan for City of Banks, Washington County	)))	FINAL ORDER APPROVING A WATER MANAGEMENT AND CONSERVATION PLAN

Authority

OAR Chapter 690, Division 086, establishes the process and criteria for approving water management and conservation plans required under the conditions of permits, permit extensions and other orders of the Department. An approved water management plan may authorize the diversion and use of water under a permit extended pursuant to OAR Chapter 690, Division 315.

Background

On April 17, 2009, the City of Banks submitted a draft Water Management and Conservation Plan for review under OAR Chapter 690, Division 086 (November 2002). Submittal of the plan was required under the Final Order approving an Extension of Time for Permit G-7593.

The Department published notice of receipt of the plan on April 21, 2009, as required under OAR Chapter 690, Division 086. No public comments were received.

The Department provided comments on the plan to the City on August 21, 2009, and, in response, the City submitted supplemental information revising the plan on June 28 and July 15, 2010.

Findings of Fact

1. The City of Banks Water Management and Conservation Plan contains all of the plan elements required under OAR 690-086-0125.

2. The projections of future water needs in the plan demonstrate a need for over 0.67 cfs of water available under Permit G-7593 to meet demands for the population anticipated in 20 years. These projections are reasonable and consistent with the City's land use plan.

3. The plan includes 5-year benchmarks for installation and maintenance of new water audit software, implementation of an annual water audit and a meter replacement program, as well as the continuation of customer meter testing, leak detection surveys and the semi-annual inclusion of educational messages and water conservation tips on water bills. The system is fully metered and the rate structure includes a base rate and volumetric charge. Unaccounted-for water is estimated at 29.5 percent.

4. The plan includes 5-year benchmarks for the evaluation, development, and implementation of a program to regularly test the City's supply meters.

This final order is subject to judicial review by the Court of Appeals under ORS 183.482. Any petition for judicial review must be filed within the 60-day time period specified by ORS 183.482(1). Pursuant to ORS 536.075 and OAR 137-003-0675, you may petition for judicial review or petition the Director for reconsideration of this order. A petition for reconsideration may be granted or denied by the Director, and if no action is taken within 60 days following the date the petition was filed, the petition shall be deemed denied.

EXHIBIT 2

5. The plan identifies unnamed surface water springs and streams in the West Fork Dairy Creek subbasin and ground water (all within the Tualatin River Basin) as the sources of the City's water rights. The plan also accurately and completely describes the federally listed Upper Willamette River Steelhead and Chinook Salmon as threatened species, and identifies water quality issues in Dairy Creek, the Tualatin River and the Willamette River downstream of the City's source water.

6. The water curtailment element included in the plan satisfactorily promotes water curtailment practices and includes a list of three stages of alert with concurrent curtailment actions.

7. The diversion of water under permit G-7593 will be expanded during the next 20 years and is consistent with OAR 690-086-0130(7), as follows:

   a. As evidenced by the 5-year benchmarks described in Findings of Fact #3 and #4, the plan includes a schedule for development of conservation measures that would provide water at a cost that is equal to or lower than the cost of other identified sources;

   b. Considering fiscal limitations that, at this time, make it impractical for the City to install infrastructure necessary to purchase and convey additional water from other entities and considering limitations in the City's available supply from their surface water sources due to high turbidity levels in the winter and limited summer flow rates, increased use from the City's ground water source is the most feasible and appropriate water supply alternative to the supplier; and

   c. The City is not required to provide mitigation to address limitations or restrictions on the development of their ground water permits, as no resource issues pertaining to those permits have been identified under OAR 690-086-0140(5)(i).

Conclusion of Law

The water management and conservation plan submitted by the City of Banks is consistent with the criteria in OAR Chapter 690, Division 086.

Now, therefore, it is ORDERED:

1. The City of Banks Water Management and Conservation Plan is approved and shall remain in effect until August 9, 2020, unless this approval is rescinded pursuant to OAR 690-086-0920.

2. The limitation of the diversion of water under Permit G-7593 established by the Extension of Time approved on November 20, 2008, is removed and, subject to other limitations or conditions of the permit, the City of Banks is authorized to divert up to 0.67 cfs under Permit G-7593.

3. The City of Banks shall submit an updated plan within 10 years and no later than August 9, 2020.

4. The City of Banks shall submit a progress report containing the information required under OAR 690-086-0120(4) by August 9, 2015.

Dated at Salem, Oregon this 10 day of August, 2010.

Dwight Ford for
Phillip C. Ward, Director

Mailing date: AUG 11 2010

SCHROEDER
LAW OFFICES, P.C.

1915 NE Cesar E. Chavez Boulevard
Portland, Oregon 97212

PORTLAND
OR 972

17 JUL 2020
PM 3 L

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$0.65 0
US POSTAGE
FIRST-CLASS
062S0009497381
97212

Oregon Water Resources Department
Attn: Kerry Kavanagh
725 Summer St. NE, Suite A
Salem, OR 97301

97301-126673

Application: G-84760 Permit: G-7593

Public Notice Route Slip ... New Application Extension of Time per Division 315 Rules... (Extensions received on July 1, 2001 or after)

Applicant/Permit Holder(s) City of Banks ✓
13680 NW. Main St
Banks OR 97106

☒ **WRIG...Money Receipted on:** 10-5-17 ✓

☒ **Extension Specialist ...**

☒ Added to tracking spreadsheet

After fee is receipted and app is added to spreadsheet, route to...

☒ **Stacy Phillips...**

☒ N/A Recent Assignment (Check WRIS for Update)

☒ Publish on Public Notice (initial 30-day comment): Date of notice 10-10-17

☒ Update WRIS Database

☒ In the "PNotice Date" field... Enter the date the Extension Application was published on the Public Notice.

☒ In the "Ext Filed" field... Enter the date the Extension Application was received.

☒ **Yes or ☐ No: Return file to Extension Specialist after PN** Jeffrey

NOTES:

STATE OF OREGON

WATER RESOURCES DEPARTMENT

725 Summer St. N.E. Ste. A
SALEM, OR 97301-4172
(503) 986-0900 / (503) 986-0904 (fax)

RECEIPT # 124808 INVOICE # _____

RECEIVED FROM: City of Banks

BY: _____

APPLICATION	G-8476
PERMIT	
TRANSFER	

CASH: ☐ CHECK:# ☒ 20429 OTHER: (IDENTIFY) ☐ _____

TOTAL REC'D $ 670.00

1083 TREASURY 4170 WRD MISC CASH ACCT

0407	COPIES		$
_____	OTHER:	(IDENTIFY) _____	$

0243 I/S Lease _____ 0244 Muni Water Mgmt. Plan _____ 0245 Cons. Water _____

4270 WRD OPERATING ACCT

46111

MISCELLANEOUS

0407	COPY & TAPE FEES		$
0410	RESEARCH FEES		$
0408	MISC REVENUE: (IDENTIFY)	_____	$
TC162	DEPOSIT LIAB. (IDENTIFY)	_____	$
0240	EXTENSION OF TIME		$ 670.00

WATER RIGHTS:

		EXAM FEE		RECORD FEE
0201	SURFACE WATER	$	0202	$
0203	GROUND WATER	$	0204	$
0205	TRANSFER	$		

WELL CONSTRUCTION

		EXAM FEE		LICENSE FEE
0218	WELL DRILL CONSTRUCTOR	$	0219	$
	LANDOWNER'S PERMIT		0220	$

_____ OTHER (IDENTIFY) _____

0536 TREASURY 0437 WELL CONST. START FEE

0211	WELL CONST START FEE	$	CARD #	
0210	MONITORING WELLS	$	CARD #	

_____ OTHER (IDENTIFY) _____

0607 TREASURY 0467 HYDRO ACTIVITY

		LIC NUMBER	
0233	POWER LICENSE FEE (FW/WRD)		$
0231	HYDRO LICENSE FEE (FW/WRD)		$
_____	HYDRO APPLICATION		$

____ TREASURY OTHER / RDX

FUND _____ TITLE _____

OBJ. CODE _____ VENDOR # _____

DESCRIPTION _____ $

RECEIPT: 124808 DATED: 10-2-17 BY: CWeetrick

Distribution – White Copy - Customer, Yellow Copy - Fiscal, Blue Copy - File, Buff Copy - Fiscal

Oregon
Kate Brown, Governor

Water Resources Department
725 Summer St NE, Suite A
Salem, OR 97301
(503) 986-0900
Fax (503) 986-0904

October 6, 2017

REFERENCE: Application for Extension of Time

Dear Extension of Time Applicant:

The Water Right Services Division has received your application for an extension of time for **APPLICATION FILE #:** G-8476 **(Permit** G-7593**).** Your application will be reviewed in the future. Following the review, you will receive a Proposed Final Order either approving or rejecting the extension of time request. A 45-day protest period begins upon issuance of the Proposed Final Order. After the protest period closes, a Final Order is issued.

You may continue the use of water under your water right until the Water Resources Department formally takes action on your extension application. If your permit includes conditions, water use reporting, water level measurement reporting, etc., you are required to comply with the conditions.

Any additional development that occurs after the expired completion date, identified on the permit or an extension order, can only be claimed upon an approved extension application.

If you have questions concerning your extension of time application, please contact Jeffrey Pierceall at (503) 986-0802. For general information about the Water Resources Department, you may contact the Water Resources' Customer Service Group at (503) 986-0801 or you may access the Department's website at: www.wrd.state.or.us.

APPLICATION NUMBER: G-8476 PERMIT NUMBER: G-7593 file MIA

Completeness Checklist for Permit Extension of Time Application

Minimum completeness criteria for Extension of Time Applications are set forth in OAR 690-086-0020(3) for NON-Municipal or NON-Quasi-Municipal permits and in OAR 690-086-0070(3) for Municipal or Quasi-Municipal permits.

☐ 1. Is the permit to be extended Non-Cancelled according to WRIS and the permit file? _____

If the permit has been cancelled, the Extension Application cannot be accepted.

☐ 2. Is the extension applicant's name and mailing address the permit holder of record?_____

If an Assignment has **not** yet occurred, and is **not** submitted with the Extension of Time Application, the application cannot be accepted.

☐ 3. Did Construction begin on or before the "A" date (Actual Construction date). If no "A" date then did construction begin by the "C" date (Completion Date)?_____

IF NO, Return application, The Extension cannot be granted.

☐ 4. Pull the permit file. If a copy of the permit is not in the file, pull up an image of the permit in WRIS.

☐ 5. Is the appropriate Extension of Time Application used? _____

If the wrong application form is used, the Extension Application cannot be accepted.

- If a Municipal or Quasi-Municipal permit, use: *"Application for Extension of Time for Municipal and Quasi-Municipal Water Use Permits."*
- If a NON-Municipal or NON-Quasi-Municipal permit, use: *"Application for Extension of Time for a Water Right Permit (Non-Municipal / Non-Quasi-municipal Water Use)."*

☐ 6. Are the requested date(s) for extension identified *(Page 1)*? _____

- Check the permit to see if it includes a "B-Date" and/or a "C-Date."

"B-Date" = date by which construction of the water delivery system for the permit is to be completed.

"C-Date" = date by which full beneficial use of water under the permit is to be accomplished AND CONSTUCTION MUST BEGIN by if no "A" DATE.

☐ 7. Is the Extension Application signed (with an original signature) by permit holder(s) of record or an authorized agent? _____

(If signed by agent, documentation from the permit holder(s) granting authorization for the agent to sign on their behalf must be provided or be present and current in the permit file.)

If **not** signed by a permit holder of record or authorized agent, the Extension Application cannot be accepted.

☐ 8. Are all questions on the application answered? _____

(NOTE: Supporting documentation such as: copies of the permit, well log(s), annual water use reports, static water level measurement reports, evidence demonstrating construction/work/water use accomplished, etc. may be included.)

☐ 9. Has the $670 fee been paid? _____

***If applicable**, has the $100 fee for the Assignment been paid? _____

(As of July 1, 2017, the Extension of Time fee is $670, and Request for Assignment fee is $100)

If the fee has **NOT** been paid, the application cannot be accepted.

***NOTE:** If the fee is the only item missing, contact the applicant to see if they can submit the fee with the next few days. If the applicant commits to submitting the fee within one week, hold the Extension Application, and explain to them that if it is not received the application will be returned (as we are required to keep any application, regardless of how complete, if retained by the Department as long as two weeks.*

☐ 10. If after completing this checklist, it is not clear whether the application can be accepted, please route both the money slip and Non-Muni Extension Application to Machelle Bamberger or Corey Courchane. For municipal application route to, Machelle Bamberger. One will either: **1)** accept the application; **2)** return the application; or **3)** prepare a deficiency letter.

Reviewed by: _____ Date: _____

Laura A. Schroeder
Oregon, Idaho,
Nevada, Washington & Utah

Therese A. Ure
Oregon & Nevada

Sarah R. Liljefelt
Oregon,
California & Utah

William F. Schroeder
(1928 - 2015)

SCHROEDER
LAW OFFICES, P.C.

Lindsay M. Thane
Oregon

Wyatt E. Rolfe
Of Counsel
Oregon & Washington

James Browitt
Of Counsel
Idaho & Washington

September 29, 2017

VIA U.S. PRIORITY MAIL

Oregon Water Resources Department
Attn: Water Right Permit Extensions
725 Summer Street NE, Suite A
Salem, Oregon 97301

RE: Application for Extension of Time for Permit G-7593

To Whom It May Concern:

Please find enclosed an application for an extension of time for Permit G-7593 (Application G-8476) submitted on behalf of City of Banks.

Please let our office know if you have any questions.

Very truly yours,
SCHROEDER LAW OFFICES, P.C.

Laura A. Schroeder

LAS:lmt

Enclosures

cc: Client

RECEIVED BY OWRD

OCT 2 2017

SALEM, OR

Application No. G-8476 Permit No. G 7593

STATE OF OREGON WATER RESOURCES DEPARTMENT

Application for a Permit to Appropriate Ground Water

RECEIVED
SEP 20 1977
WATER RESOURCES DEPT
SALEM, OREGON

I, City of Banks, Oregon (Name of Applicant)

of City Hall (Mailing Address), Banks (City)

State of Oregon, 97106 (Zip Code) Phone No. Mayor Howard Steinbach 324-2251 do hereby
Robert Prickett, City Recorder 324-8462

make application for a permit to appropriate the following described ground waters of the State of Oregon:

1. The development will consist of one well (Give number of wells, tile lines, infiltration galleries, etc.)

having a diameter of 8 inches and an estimated depth of 450 feet.

2. The well or other source is to be located 135 ft. S (N. or S.) and 560 ft. W (E. or W.)

from the ¼ corner of X on the north line of Section 31, T2N, R3W, W.M. (Public Land Survey Corner)

(If there is more than one well, each must be described)

being within the NE ¼ of the NW ¼ of

Sec. 31 Tp. 2N R. 3W, W.M., in the county of Washington

3. Location of area to be irrigated, or place of use if use other than irrigation.

Township	Range	Section	List ¼ ¼ of Section	List use and/or number of acres to be irrigated
SEE ATTACHED	SHEET #1			

4. It is estimated that 210 feet of the well will require 8 5/8" diameter welded steel (Kind) casing.

5. Depth to water table is estimated ..... (Feet) Well drilled by A.M. Jannsen Drilling Co. Aloha, Oregon

Form 690-3-0-1-77

6. *The amount of water which the applicant intends to apply to beneficial use is* ..... *cubic feet per second or* ....300..... *gallons per minute.*

7. *The use to which the water is to be applied is* municipal.

8. *If the flow to be utilized is artesian, the works to be used for the control and conservation of the supply when not in use must be described.*

(not artesian)

9. *If the location of the well, or other development work is less than one-fourth mile from a natural stream channel, give the distance to the channel and the difference in elevation between the stream bed and the ground surface at the source of development.*

Natural stream channel (intermittent flow) 130 feet due east of well. Well is 10 feet higher than streambed.

10. *DESCRIPTION OF WORKS*

Include length and dimensions of supply ditch or pipeline, size and type of pump and motor, type of irrigation system to adequately describe the proposed distribution system.

Water will be conveyed from well to existing city reservoir (as shown on attached map) through an 8-inch pipeline.

The proposed well pump will be a 40 H.P., 14 stage deep well turbine capable of delivering 300 gallons per minute to a 400 ft. T.D.H.

11. *Construction work will begin on or before* Well construction - August 16, 1977; Pump & pipeline - January, 1978

12. *Construction work will be completed on or before* Well construction - August 24, 1977; Pump & pipeline - June, 1978

13. *The water will be completely applied to the proposed use on or before* July, 1978

14. *If the ground water supply is supplemental to an existing supply, identify the supply and existing water right.* See attached map showing existing water supply system. Water right certificate no. 5353.

Application No. 6-8476 *Permit No.* G 7593

SHEET #1

3. Location of area to be irrigated, or place of use if use other than irrigation.

Township	Range	Section	List ¼ ¼ of Section
T2N	R3W	29	SW¼ SW¼
T2N	R3W	30	NW¼ SW¼
			SW¼ SW¼
			SE¼ SW¼
			SW¼ SE¼
			SE¼ SE¼
T2N	R3W	31	NW¼ NW¼
			NE¼ NW¼
			NW¼ NE¼
			NE¼ NE¼
			SE¼ NE¼
			SE¼ NW¼
			SW¼ NW¼
			NW¼ SW¼
			SW¼ SW¼
T2N	R3W	32	NW¼ NW¼
			SW¼ NW¼
T2N	R4W	25	NE¼ SE¼
			SE¼ SE¼
			SW¼ SE¼
T2N	R4W	36	NW¼ NE¼
			NE¼ NE¼
			SE¼ NE¼
			NE¼ SE¼
			SE¼ SE¼

Application No. G-8476
Permit No. G 7593

SHEET #2

REMARKS:

The City of Banks presently obtains it's water supply from springs about 4 miles north of the City (see Water Right Certificate No. 5353 and attached map). The present supply is not sufficient to meet summer-time needs; therefore a new well was constructed. At present, Banks supplys water to 747 persons and in year 2000 it is estimated that 1,971 persons will be served. Average day water requirements are presently 104,500 G.P.D. and in year 2000 it is estimated to be 276,000 G.P.D.

Requirements of the average day of the maximum month are presently 200,000 G.P.D. and in year 2000 it is estimated to be 524,000 G.P.D. The present supply (springs) can provide 173,000 G.P.D. and the proposed well can supply 432,000 G.P.D. for a total of 605,000 G.P.D. which will meet the estimated needs in year 2000.

Application No. 6-8476
Permit No.

Remarks: SEE ATTACHED SHEET #2

Howard D. Steinbock Mayor
Signature of Applicant
City of Banks, Banks, Or.

This is to certify that I have examined the foregoing application, together with the accompanying maps and data, and return the same for

In order to retain its priority, this application must be returned to the Water Resources Director with corrections on or before , 19

WITNESS my hand this day of , 19

Water Resources Director

By

This instrument was first received in the office of the Water Resources Director at Salem, Oregon, on the 29TH *day of* SEPTEMBER, 19 77, *at* 8:00 *o'clock* A *M.*

Application No. G-8476 *Permit No.* G 7593

Application No. G-8476 Permit No. G 7593

Permit to Appropriate the Public Waters of the State of Oregon

This is to certify that I have examined the foregoing application and do hereby grant the same, SUBJECT TO EXISTING RIGHTS INCLUDING THE EXISTING MINIMUM FLOW POLICIES ESTABLISHED BY THE WATER POLICY REVIEW BOARD and the following limitations and conditions:

The right herein granted is limited to the amount of water which can be applied to beneficial use and shall not exceed 0.67 *cubic feet per second measured at the point of diversion from the well or source of appropriation, or its equivalent in case of rotation with other water users, from* a well

The use to which this water is to be applied is municipal.

If for irrigation, this appropriation shall be limited to ..... *of one cubic foot per second or its equivalent for each acre irrigated and shall be further limited to a diversion of not to exceed* ..... *acre feet per acre for each acre irrigated during the irrigation season of each year;*

and shall be subject to such reasonable rotation system as may be ordered by the proper state officer.

The well shall be constructed in accordance with the General Standards for the Construction and Maintenance of Water Wells in Oregon.

The works constructed shall include an air line and pressure gauge or an access port for measuring line, adequate to determine water level elevation in the well at all times.

The permittee shall install and maintain a weir, meter, or other suitable measuring device, and shall keep a complete record of the amount of ground water withdrawn.

The priority date of this permit is September 29, 1977

Actual construction work shall begin on or before December 2, 1978 *and shall thereafter be prosecuted with reasonable diligence and be completed on or before October 1, 19*79

*Complete application of the water to the proposed use shall be made on or before October 1, 19*80

WITNESS my hand this 2nd *day of* December, *19*77

James E. Sexson

Water Resources Director

Oregon Water Resources Department
Water Rights Division

Water Rights Application
Number G-8476

Final Order
Extension of Time for Permit Number G-7593

Appeal Rights

This is a final order in other than contested case. This order is subject to judicial review under ORS 183.484. Any petition for judicial review must be filed within the 60 day time period specified by ORS 183.484(2). Pursuant to ORS 536.075 and OAR 137-004-0080 you may either petition for judicial review or petition the Director for reconsideration of this order. A petition for reconsideration may be granted or denied by the Director, and if no action is taken within 60 days following the date the petition was filed, the petition shall be deemed denied.

Application History

The Department issued Permit G-7593 on December 2, 1977. The permit called for completion of construction by October 1, 1979, and complete application of water to beneficial use by October 1, 1980. On May 17, 2007, the City of Banks submitted an application to the Department for an extension of time for Permit G-7593. In accordance with OAR 690-315-0050(2), on September 11, 2007, the Department issued a Proposed Final Order proposing to extend the time to complete construction to October 1, 2017 and to extend the time to fully apply water to beneficial use to October 1, 2017. The protest period closed October 26, 2007, in accordance with OAR 690-315-0060(1). No protest was filed.

At time of issuance of the Proposed Final Order the Department concluded that, based on the factors demonstrated by the applicant, the permit may be extended subject to the following conditions:

CONDITIONS

1. **Development Limitations**

Diversion of any water beyond 0.613 cfs under Permit G-7593 shall only be authorized upon issuance of a final order approving a Water Management and Conservation Plan (WMCP) under OAR Chapter 690, Division 86. The required WMCP shall be submitted to the Department within 3 years of an approved extension application. Use of water under Permit G-7593 must be consistent with this and subsequent WMCP's approved under OAR Chapter 690, Division 86 on file with the Department.

The deadline established in this PFO for submittal of a WMCP shall not relieve a permit holder of any existing or future requirement for submittal of a WMCP at an earlier date as

established through other orders of the Department. A WMCP submitted to meet the requirements of this order may also meet the WMCP submittal requirements of other Department orders.

The applicant has demonstrated good cause for the permit extension pursuant to ORS 537.630, 539.010(5) and OAR 690-315-0080(3).

Order

The extension of time for Application G-8476, Permit G-7593, therefore, is approved subject to conditions contained herein. The deadline for completing construction is extended to October 1, 2017. The deadline for applying water to full beneficial use is extended to October 1, 2017.

DATED: November 20, 2008

Dwight French, Administrator of
Water Rights and Adjudications
for
Phillip C. Ward, Director

If you have any questions about statements contained in this document, please contact Ann L. Reece at (503) 986-0827.

If you have other questions about the Department or any of its programs, please contact our Water Resources Customer Service Group at (503) 986-0900.

BEFORE THE WATER RESOURCES DEPARTMENT
OF THE
STATE OF OREGON

In the Matter of the Proposed Water Management and Conservation Plan for City of Banks, Washington County	)))	FINAL ORDER APPROVING A WATER MANAGEMENT AND CONSERVATION PLAN

Authority

OAR Chapter 690, Division 086, establishes the process and criteria for approving water management and conservation plans required under the conditions of permits, permit extensions and other orders of the Department. An approved water management plan may authorize the diversion and use of water under a permit extended pursuant to OAR Chapter 690, Division 315.

Background

On April 17, 2009, the City of Banks submitted a draft Water Management and Conservation Plan for review under OAR Chapter 690, Division 086 (November 2002). Submittal of the plan was required under the Final Order approving an Extension of Time for Permit G-7593.

The Department published notice of receipt of the plan on April 21, 2009, as required under OAR Chapter 690, Division 086. No public comments were received.

The Department provided comments on the plan to the City on August 21, 2009, and, in response, the City submitted supplemental information revising the plan on June 28 and July 15, 2010.

Findings of Fact

1. The City of Banks Water Management and Conservation Plan contains all of the plan elements required under OAR 690-086-0125.

2. The projections of future water needs in the plan demonstrate a need for over 0.67 cfs of water available under Permit G-7593 to meet demands for the population anticipated in 20 years. These projections are reasonable and consistent with the City's land use plan.

3. The plan includes 5-year benchmarks for installation and maintenance of new water audit software, implementation of an annual water audit and a meter replacement program, as well as the continuation of customer meter testing, leak detection surveys and the semi-annual inclusion of educational messages and water conservation tips on water bills. The system is fully metered and the rate structure includes a base rate and volumetric charge. Unaccounted-for water is estimated at 29.5 percent.

4. The plan includes 5-year benchmarks for the evaluation, development, and implementation of a program to regularly test the City's supply meters.

This final order is subject to judicial review by the Court of Appeals under ORS 183.482. Any petition for judicial review must be filed within the 60-day time period specified by ORS 183.482(1). Pursuant to ORS 536.075 and OAR 137-003-0675, you may petition for judicial review or petition the Director for reconsideration of this order. A petition for reconsideration may be granted or denied by the Director, and if no action is taken within 60 days following the date the petition was filed, the petition shall be deemed denied.

5. The plan identifies unnamed surface water springs and streams in the West Fork Dairy Creek subbasin and ground water (all within the Tualatin River Basin) as the sources of the City's water rights. The plan also accurately and completely describes the federally listed Upper Willamette River Steelhead and Chinook Salmon as threatened species, and identifies water quality issues in Dairy Creek, the Tualatin River and the Willamette River downstream of the City's source water.

6. The water curtailment element included in the plan satisfactorily promotes water curtailment practices and includes a list of three stages of alert with concurrent curtailment actions.

7. The diversion of water under permit G-7593 will be expanded during the next 20 years and is consistent with OAR 690-086-0130(7), as follows:

   a. As evidenced by the 5-year benchmarks described in Findings of Fact #3 and #4, the plan includes a schedule for development of conservation measures that would provide water at a cost that is equal to or lower than the cost of other identified sources;

   b. Considering fiscal limitations that, at this time, make it impractical for the City to install infrastructure necessary to purchase and convey additional water from other entities and considering limitations in the City's available supply from their surface water sources due to high turbidity levels in the winter and limited summer flow rates, increased use from the City's ground water source is the most feasible and appropriate water supply alternative to the supplier; and

   c. The City is not required to provide mitigation to address limitations or restrictions on the development of their ground water permits, as no resource issues pertaining to those permits have been identified under OAR 690-086-0140(5)(i).

Conclusion of Law

The water management and conservation plan submitted by the City of Banks is consistent with the criteria in OAR Chapter 690, Division 086.

Now, therefore, it is ORDERED:

1. The City of Banks Water Management and Conservation Plan is approved and shall remain in effect until August 9, 2020, unless this approval is rescinded pursuant to OAR 690-086-0920.

2. The limitation of the diversion of water under Permit G-7593 established by the Extension of Time approved on November 20, 2008, is removed and, subject to other limitations or conditions of the permit, the City of Banks is authorized to divert up to 0.67 cfs under Permit G-7593.

3. The City of Banks shall submit an updated plan within 10 years and no later than August 9, 2020.

4. The City of Banks shall submit a progress report containing the information required under OAR 690-086-0120(4) by August 9, 2015.

Dated at Salem, Oregon this 10 day of August, 2010.

Dwight Ford for
Phillip C. Ward, Director

Mailing date: AUG 11 2010

Mailing List for Extension FO Copies

Copies Mailed
By: SP
(SUPPORT STAFF)
on: 1-5-18
(DATE)

FO Date: January 5, 2018

Application G-8476
Permit G-7593

Original mailed to permit holder:

City of Banks
Attn: Jolynn Becker
13680 NW Main St.
Banks, OR 97106

Copies sent to:

1. WRD - App. File G-8476/ Permit G-7593

Fee paid as specified under ORS 536.050 to receive copy:

2. None

Receiving electronic copy via e-mail (10 AM day of signature date)
(DONE BY EXTENSION SPECIALIST)

3. WRD - Watermaster District 18, Jake Constans

4. WRD – **If WMCP needed* – Kerri Cope/Chris Kowitz, Water Supply and Conservation Team (WMCP)
   *Done by*_____ *Date*_____

CASEWORKER: JDP

Oregon Water Resources Department
Water Right Services Division

In the Matter of the Application for an Extension of Time for Permit G-7593, Water Right Application G-8476, in the name of the City of Banks	)))	**FINAL ORDER**

Permit Information

Application File G-8476/ Permit G-7593
Basin 2C – Lower Willamette Basin / Watermaster District 18
Date of Priority: September 29, 1977

Authorized Use of Water

Source of Water:	A well in West Fork Dairy Creek Basin
Purpose or Use:	Municipal
Maximum Rate:	0.67 Cubic Foot per Second (CFS)

This Extension of Time request is being processed in accordance with Oregon Revised Statute 537.630 and 539.010(5), and Oregon Administrative Rule Chapter 690, Division 315.

Appeal Rights
This final order is subject to judicial review by the Court of Appeals under ORS 183.482. Any petition for judicial review must be filed within the 60-day time period specified by ORS 183.482(1). Pursuant to ORS 536.075 and OAR 137-003-0675, you may petition for judicial review or petition the Director for reconsideration of this order. A petition for reconsideration may be granted or denied by the Director, and if no action is taken within 60 days following the date the petition was filed, the petition shall be deemed denied.

Application History
Permit G-7593 was issued by the Department on December 12, 1977. The permit specified that construction of the water development project was to begin on or before December 2, 1978, construction was to be completed on or before October 1, 1979, and the complete application of water was to be made on or before October 1, 1980. The most recent extension authorized completion of construction and complete application of water to beneficial use by October 1, 2017. On October 2, 2017, the City of Banks submitted an application for an extension of time for Permit G-7593. In accordance with OAR 690-315-0050(2), on November 14, 2017, the Department issued a Proposed Final Order proposing to extend the time to complete construction to October 1, 2027, and to extend the time to fully apply water to beneficial use to October 1, 2027. The protest period closed December 29, 2017, in accordance with OAR 690-315-0060(1). No protest was filed.

FINDINGS OF FACT

The Department adopts and incorporates by reference the findings of fact in the Proposed Final Order dated November 14, 2017.

At time of issuance of the Proposed Final Order the Department concluded that, based on the factors demonstrated by the applicant, the permit may be extended subject to the following condition:

CONDITIONS

1. **Development Limitations**
   A maximum appropriation of 0.613 cfs of water is currently allowed under Permit G-7593. Any appropriation of water beyond 0.613 cfs (not to exceed the maximum amount authorized under the permit, being 0.67 cfs) shall only be authorized upon issuance of a final order approving a Water Management and Conservation Plan (WMCP) under OAR Chapter 690, Division 86 that authorizes access to a greater rate of appropriation of water under the permit consistent with OAR 690-086-0130(7). The required WMCP shall be submitted to the Department within 3 years of this Final Order. The amount of water used under Permit G-7593 must be consistent with this and subsequent WMCP's approved under OAR Chapter 690, Division 86 on file with the Department.

   The Development Limitation established in the above paragraph supersedes any prior limitation of the appropriation of water under Permit G-7593 that has been established under a prior WMCP or Extension final order issued by the Department.

   The deadline established in the Extension Final Order for submittal of a WMCP shall not relieve a permit holder of any existing or future requirement for submittal of a WMCP at an earlier date as established through other orders of the Department. A WMCP submitted to meet the requirements of the final order may also meet the WMCP submittal requirements of other Department orders.

CONCLUSION OF LAW

The applicant has demonstrated good cause for the permit extension pursuant to ORS 537.630, 539.010(5) and OAR 690-315-0080(3).

ORDER

The extension of time for Application G-8476, Permit G-7593, therefore, is approved subject to conditions contained herein. The deadline for completing construction is extended from October 1, 2017, to October 1, 2027. The deadline for applying water to full beneficial use within the terms and conditions of the permit is extended from October 1, 2017, to October 1, 2027.

DATED: January 5, 2018

Dwight French
Water Right Services Division Administrator, for
Thomas M. Byler, Director
Oregon Water Resources Department

If you have any questions about statements contained in this document, please contact Jeffrey Pierceall at 503-986-0802.

If you have other questions about the Department or any of its programs, please contact our Water Resources Customer Service Group at (503) 986-0900.

Mailing List for Extension PFO Copies

Copies Mailed
By: JP
(SUPPORT STAFF)
on: 11-14-17
(DATE)

PFO Date: November 14, 2017

Application G-8476
Permit G-7593

Original mailed to Applicant:

City of Banks
Attn: Jolynn Becker
13680 NW Main St.
Banks, OR 97106

Copies sent to:

1. WRD - App. File G- 8476/ Permit G-7593

Fee paid as specified under ORS 536.050 to receive copy:

2. None

Receiving electronic copy via e-mail (10 AM Tuesday of signature date)

3. WRD - Watermaster District 18 – Jake Constans

4. WRD – ****If WMCP needed*** – Kerri Cope/Chris Kowitz, Water Supply and Conservation Team (WMCP)
*Done by*_____ *Date*_____

CASEWORKER: JDP

NA JP

For OWRD use only

WRD Concurs with these "Consumptive Use Percentages" Updates ☐ Yes ☐ No

Approved by: _____ Date:

_____
for the Water Resources Director

Oregon Water Resources Department
Water Right Services Division

Application for Extension of Time

In the Matter of the Application for an Extension of Time for Permit G-7593, Water Right Application G-8476, in the name of the City of Banks	)))	PROPOSED FINAL ORDER

Permit Information

Application File G-8476/ Permit G-7593
Basin 2C – Lower Willamette Basin / Watermaster District 18
Date of Priority: September 29, 1977

Authorized Use of Water

Source of Water:	A well in West Fork Dairy Creek Basin
Purpose or Use:	Municipal
Maximum Rate:	0.67 Cubic Foot per Second (CFS)

This Extension of Time request is being processed in accordance with Oregon Administrative Rule Chapter 690, Division 315.

Please read this Proposed Final Order in its entirety as it contains additional conditions not included in the original permit.

This Proposed Final Order applies only to Permit G-7593, water right Application G-8476.

Summary of Proposed Final Order for Extension of Time

The Department proposes to:

- Grant an extension of time to complete construction from October 1, 2017, to October 1, 2027.
- Grant an extension of time to apply water to full beneficial use from October 1, 2017, to October 1, 2027.
- Make the extension of time subject to certain conditions as set forth below.

ACRONYM QUICK REFERENCE

Department – Oregon Department of Water Resources
City – City of Banks
ODFW – Oregon Department of Fish and Wildlife
PFO – Proposed Final Order
WMCP – Water Management and Conservation Plan
APOA – Additional Point of Appropriation
Behrman Well - WASH 7651
Well 2 - WASH 62373
UGB – Urban Growth Boundary

Units of Measure

cfs – cubic feet per second
gpm – gallons per minute

AUTHORITY

Generally, see ORS 537.630 and OAR Chapter 690 Division 315.

ORS 537.630(2) provides in pertinent part that the Oregon Water Resources Department (Department) may, for good cause shown, order and allow an extension of time, for the completion of the well or other means of developing and securing the ground water or for complete application of water to beneficial use. In determining the extension, the department shall give due weight to the considerations described under ORS 539.010 (5) and to whether other governmental requirements relating to the project have significantly delayed completion of construction or perfection of the right.

ORS 539.010(5) provides in pertinent part that the Water Resources Director, for good cause shown, may extend the time within which the full amount of the water appropriated shall be applied to a beneficial use. This statute instructs the Director to consider: the cost of the appropriation and application of the water to a beneficial purpose; the good faith of the appropriator; the market for water or power to be supplied; the present demands therefore; and the income or use that may be required to provide fair and reasonable returns upon the investment.

OAR 690-315-0080 provides in pertinent part that the Department shall make findings to determine if an extension of time for municipal and/or quasi-municipal water use permit holders may be approved to complete construction and/or apply water to full beneficial use. Under specific circumstances, the Department may condition extensions of time for municipal water use permit holders to provide that use of the undeveloped portion of the permit maintains the persistence of listed fish species in the portions of the waterways affected by water use under the permit.

OAR 690-315-0050(5) authorizes the Department to include in an extension order, but is not limited to, any condition or provision needed to: ensure future diligence; mitigate the effects of the subsequent development on competing demands on the resource; and periodically document the continued need for the permit.

OAR 690-315-0090(3) authorizes the Department, under specific circumstances, to condition an extension of time for municipal and/or quasi-municipal water use permit holders to provide that diversion of water beyond the maximum rate diverted under the permit or previous extension(s) shall only be authorized upon issuance of a final order approving a Water Management and Conservation Plan under OAR Chapter 690, Division 86.

FINDINGS OF FACT

1. On December 12, 1977, Permit G-7593 was issued by the Department. The permit authorizes the use of up to 0.67 cfs of water from a well in West Fork Dairy Creek Basin, for municipal use. It specified that construction of the water development project was to begin on or before December 2, 1978, construction was to be completed on or before October 1, 1979, and the complete application of water was to be made on or before October 1, 1980.

2. One prior permit extensions has been granted for Permit G-7593. The most recent extension request resulted in the completion dates for construction and full application of water being extended from October 1, 1980, to October 1, 2017.

3. On December 28, 2005, the Department received a Permit Amendment T-10055 requesting to add an additional point of appropriation (APOA) to Permit G-7593. The Permit Amendment is under review.

4. On October 2, 2017, the City of Banks (City), submitted an "Application for Extension of Time" (Application) to the Department requesting the time to complete construction and apply water to full beneficial use under the terms and conditions of Permit G-7593 be extended from October 1, 2017, to October 1, 2027.

5. Notification of the City's Application for Extension of Time for Permit G-7593 was published in the Department's Public Notice dated October 10, 2017. No public comments were received regarding the extension application.

Review Criteria for Municipal Quasi-Municipal Water Use Permits *[OAR 690-315-0080(1)]*
The time limits to complete construction and/or apply water to full beneficial use may be extended if the Department finds that the permit holder has met the requirements set forth under OAR 690-315-0080. This determination shall consider the applicable requirements of ORS 537.230[1], 537.630[2] and/or 539.010(5)[3]

Complete Extension of Time Application *[OAR 690-315-0080(1)(a)]*

6. On October 2, 2017, the Department received a completed Application for Extension of Time and the fee specified in ORS 536.050 from the permit holder.

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[1] ORS 537.230 applies to surface water permits only.

[2] ORS 537.630 applies to ground water permits only.

[3] ORS 537.010(5) applies to surface water and ground water permits.

Start of Construction *[OAR 690-315-0080(1)(b)]*

7. Permit G-7593 was issued prior to June 29, 2005; therefore, the applicant is not required to provide evidence of actions taken to begin actual construction of the project.[4]

Duration of Extension *[OAR 690-315-0080(1)(c) and (1)(d)]*
Under OAR 690-315-0080(1)(c),(d), in order to approve an extension of time for municipal and quasi-municipal water use permits the Department must find that the time requested is reasonable and the applicant can complete the project within the time requested.

8. The remaining work to be accomplished under Permit G-7593 consists of completing construction; which includes gaining approval of Permit Amendment T-10055 requesting an additional point of appropriation (APOA), being WASH 62373 (Well 2), or, if T-10055 is not approved, submitting a new Permit Amendment to add an APOA and constructing a new well, upgrading the distribution system, and applying water to full beneficial use.

9. As of October 1, 2017, the City had appropriated 0.613 cfs of the 0.67 cfs of water authorized under Permit G-7593 for municipal purposes. There is an undeveloped portion of 0.057 cfs of water under Permit G-7593 as per OAR 690-315-0010(6)(g).

10. In addition to the 0.67 cfs of water authorized under Permit G-7593, the City holds the following rights:

    - Certificate 5353 for 0.42 cfs of water from a spring, tributary of Dairy Creek for Municipal Use;
    - Certificate 83138 for 0.18 cfs of water from two unnamed streams, tributaries of West Fork Dairy Creek for Municipal Use; and
    - Permit G-16312 for 1.0 cfs of water from a well (WASH 62373) in West Fork Dairy Creek Basin for Municipal Use;

    These water rights and permits total 2.89 cfs of water, being 1.67 cfs of ground water and 0.60 cfs of live flow (surface) water. The City of Banks has not yet made use of 1.057 cfs of water, being 0.057 under Permit G-7593 and 1.0 cfs of water under Permit G-16312. The City's water rights are not necessarily additive; water is not available at all sources during all seasons of the year. The City's surface water sources suffer from high turbidity during the winter months, and the limited flow rates creates a less reliable water source in the summer. The City relies on the Behrman Well as the primary source of water, and it is limited by the capacity of the current pump and motor, being 230 gpm. (WMCP Section 2.6)

11. According to the City, their peak water demand within its service area boundaries was 0.39 cfs in 2016.

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[4] Section 5, Chapter 410, Oregon Laws 2005 and OAR 690-315-0070(3)(d).

12. The City currently serves an additional 305 customers outside of the place use authorized by Permit G-7593. However, ORS 540.510(3)(a) allows water use under a permit issued to a municipality to be applied to beneficial use on lands to which the right is not appurtenant if the use continues to be for municipal purposes and would not interfere or impair prior vested water rights.

13. In 2016, the population within the service boundary of the City of Banks was 1,785. The City of Banks estimates the population will increase at growth rate of 2.3 percent per year, reaching an estimated population of 2,811 by the year 2030. The city estimates that full buildout to the Urban Growth Boundary (UGB) will likely occur by 2024, based on the estimated population growth. The rapid population growth will likely bring additional commercial ventures, which will also rely on the City's water system. Population estimates provided in the City's 2010 Water Management and Conservation Plan (WMCP) identify an anticipated service area population of 4,044 customers, being 3,739 customers located within the UGB and 305 customers located outside the UGB. There is currently a moratorium on creating new connections outside the UGB, and the 305 customers served outside the UGB are presumed to remain consistent. (WMCP Section 5, Table 5-1)

14. According to the City, their peak day demand is projected to be approximately 2.19 cfs of water by the year 2030. According to the City, future anticipated maximum demand will be 984 gallons per minute (gpm) (2.19 cfs) by 2028. (WMCP Section 5, Table 5-2)

15. Full development of Permit G-7593 is needed to address the present and future water demand of the City, including system redundancy and emergency use.

Based on Findings of Fact 7 through 15, the Department has determined that the City's request for an extension of time until October 1, 2027, to complete construction and to apply water to full beneficial use under the terms and conditions of Permit G-7593 is both reasonable and necessary.

Good Cause *[OAR 690-315-0080(1)(e) and (3)(a-g)and (4)]*
The Department's determination of good cause shall consider the requirements set forth under OAR 690-315-0080(3) and OAR 690-315-0080(4).

Reasonable Diligence and Good Faith of the Appropriator *[OAR 690-315-0080(3)(a),(3)(c) and (4)]*
Reasonable diligence and good faith of the appropriator must be demonstrated during the permit period or prior extension period as a part of evaluating good cause in determining whether or not to grant an extension. In determining the reasonable diligence and good faith of a municipal or quasi-municipal water use permit holder, the Department shall consider activities associated with the development of the right including, but not limited to, the items set forth under OAR 690-315-0080(4) and shall evaluate how well the applicant met the conditions of the permit or conditions of a prior extension period.

16. Prior to the issuance of Permit G-7593, the City constructed WASH 7651 (Behrman Well). According to the well log received by the Department on September 6, 1977, construction of Behrman Well began August 16, 1977.

17. Work was accomplished (specified in the Application for Extension of Time) during the original development time frame under Permit G-7593.

18. During the last extension period, being October1, 1980, to October 1, 2017, the City accomplished the following work:

- completed an "Engineering Investigation of the Banks Water System and a Master Plan for Future Development";
- constructed the 500,000 gallon Carsten Reservoir Tank No. 1;
- constructed a 12-inch water main loop and 8,000 linier feet of 8-inch distribution piping;
- constructed the 1,000,000 gallon Carsten Reservoir Tank No. 2;
- added telemetry and meters to monitor production rates;
- installed new line from the well to the reservoir;
- installed metering zones to detect system leaks;
- installed and updated SCADA program;
- prepared and submitted a Water Management and Conservation Plan;
- created intermediate pressure zones; and
- implemented a Water Conservation program

Based on FOF 16 through 18, the Department has determined that work has been accomplished during the last authorized extension time period, which provides evidence of good cause and reasonable diligence in developing the permit.

19. As of October 2, 2017, they have invested approximately $2,817,452, which is approximately 75 percent of the total projected cost for complete development of this project. The City estimates an additional $941,500 investment is needed for the completion of this project. The Department recognizes that while some of these investment costs are unique to construction and development solely under G-7593, other costs included in this accounting are not partitioned out for G-7593 because (1) they are incurred under the development of a water supply system jointly utilized under other rights held by the City, and (2) they are generated from individual activities counted towards reasonable diligence and good faith as listed in OAR 690-315-0080(4) which are not associated with just this permit, but with the development and exercise of all the City's water rights.

20. As of October 1, 2017, a maximum rate of 0.613 cfs of water, of the 0.67 cfs of water allowed has been appropriated from Behrman Well for beneficial municipal purposes under the terms of this permit.

21. The Department has considered the City's compliance with conditions, and did not identify any concerns.

Cost to Appropriate and Apply Water to a Beneficial Purpose *[OAR 690-315-0080(3)(b)]*

22. As of October 2, 2017, the City has invested approximately $2,817,452, which is 75 percent of the total projected cost for complete development of this project. The City estimates an additional $941,500 investment is needed for the completion of this project.

The Market and Present Demands for Water *[OAR 690-315-0080(3)(d)]*

23. As described in Findings 9 through 14 above, the City has indicated, and the Department finds that the City must rely on full development of their Permit G-7593.

24. The City projects a population increase, on average, of 2.3 percent per year over an 11 year period, being the years 2016 to 2027. According to the City's 2010 WMCP, the City of Banks currently has the supply and storage needed to service its existing customers. Planned land use and the population growth associated with water usage forecasts suggest the City will need to increase its water supply in order to keep up with the rising demand. (WMCP Section 5.0, page 18)

25. Given the current water supply situation of the City, including current and expected demands, the need for system redundancy, and emergency water supply, there is a market and present demand for the water to be supplied under G-7593.

26. OAR 690-315-0090(3) requires the Department to place a condition on this extension of time to provide that appropriation of water beyond 0.613 cfs (not to exceed the maximum amount authorized under this permit, being 0.67 cfs) under Permit G-7593 shall only be authorized upon issuance of a final order approving a Water Management and Conservation Plan(s) (WMCP) under OAR Chapter 690, Division 86 which grants access to a greater appropriation of water under the permit consistent with OAR 690-086-0130(7). A "Development Limitation" condition" is specified under Item 1 of the "Conditions" section of this PFO to meet this requirement.

Fair Return Upon Investment *[OAR 690-315-0080(3)(e)]*

27. The City employs a rate structure based in part on metered water usage. Water customers are charged a base rate for up to 400 cubic feet per month, and a unit price for any water used above that base amount. The rate structure allows customers to have access to the amount of water they need as well as providing an incentive for conservation. Use and income from the permitted water development project would likely result in reasonable returns upon the investment made in the project to date.

Other Governmental Requirements *[OAR 690-315-0080(3)(f)]*

28. According to the City, delay in the development of this project was caused, in part, by requirements of the 1986 Federal Surface Water Treatment Rule. The City was required to construct a sand filtration plant, which was completed in 1997.

Events which Delayed Development under the Permit *[OAR 690-315-0080(3)(g)]*

29. Delay of development under Permit G-7593 was due, in part, to the size and scope of the municipal water system, which was designed to be phased in over a period of years.

Maintaining the Persistence of Listed Fish Species *[OAR 690-315-0080(1)(f) and (2)]*
The Department's determination regarding maintaining the persistence of listed fish species shall be based on existing data and advice of the Oregon Department of Fish and Wildlife (ODFW). The determination shall be limited to impacts related to stream flow as a result of use of the undeveloped portion of the permit and further limited to where, as a result of use of the undeveloped portion of the permit, ODFW indicates that stream flow would be a limiting factor for the subject listed fish species.

30. This will be the second extension of time issued after June 29, 2005, for this permit, which is a municipal use permit issued before November 2, 1998. A Final Order on the first extension of time after June 29, 2005, was issued on November 20, 2008. Thus, this extension of time request is not subject to fish persistence criteria under 690-315-0080(1)(f) and (2).

CONCLUSIONS OF LAW

1. The City is entitled to apply for an extension of time to complete construction and/or completely apply water to the full beneficial use pursuant to ORS 537.630(2).

2. The City has submitted a complete extension application form and the fee specified under ORS 536.050(1)(k), as required by OAR 690-315-0080(1)(a).

3. Pursuant to Section 5, Chapter 410, Oregon Laws 2005, the permit holder is not required to demonstrate that actual construction of the project began within one year of the date of issuance of the permit, as otherwise required by OAR 690-315-0080(1)(b).

4. Pursuant to ORS 540.510(3)(a) and (b), water under Permit G-7593 may be applied to beneficial use on land to which the right is not appurtenant.

5. The time requested to complete construction and apply water to full beneficial use is reasonable, as required by OAR 690-315-0080(1)(c).

6. Completion of construction and full application of water to beneficial use can be completed by October 1, 2027[5] pursuant to OAR 690-315-0080(1)(d).

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[5] For permits applied for or received on or before July 9, 1987, upon complete development of the permit, you must notify the Department that the work has been completed and either: (1) hire a water right examiner certified under ORS 537.798 to conduct a survey, the original to be submitted as required by the Department, for issuance of a water right certificate; or (2) continue to appropriate water under the water right permit until the Department conducts a survey and issues a water right certificate under ORS 537.625.

7. The Department has considered the reasonable diligence and good faith of the appropriator, the cost to appropriate and apply water to a beneficial purpose, the market and present demands for water to be supplied, the financial investment made and the fair return upon the investment, the requirements of other governmental agencies, and unforeseen events over which the water right permit holder had no control, and the Department has determined that the City has shown good cause for an extension of time to complete construction and to apply the water to full beneficial use pursuant to OAR 690-315-0080(1)(e).

8. As required by OAR 690-315-0090(3) and as described in Finding 25, above, and specified under Item 1 of the "Conditions" section of this PFO, the appropriation of water beyond 0.613 cfs (not to exceed the maximum amount authorized under this permit, being 0.67 cfs) under Permit G-7593 shall only be authorized upon issuance of a final order approving a Water Management and Conservation Plan(s) under OAR Chapter 690, Division 86 that authorizes access to a greater rate of appropriation of water under the permit consistent with OAR 690-086-0130(7).

9. As described in Finding 29, above, this will be the 2nd extension issued after June 29, 2005 for this permit, which is a municipal use permit issued before November 2, 1998; therefore this extension of time request is not subject to fish persistence criteria under 690-315-0080(1)(f) and (2).

Proposed Order

Based upon the foregoing Findings of Fact and Conclusions of Law, the Department proposes to issue an order to:

Extend the time to complete construction under Permit G-7593 from October 1, 2017, to October 1, 2027.

Extend the time to apply the water to beneficial use under Permit G-7593 from October 1, 2017, to October 1, 2027.

Subject to the following condition:

CONDITION

1. **Development Limitations**
A maximum appropriation of 0.613 cfs of water is currently allowed under Permit G-7593. Any appropriation of water beyond 0.613 cfs (not to exceed the maximum amount authorized under the permit, being 0.67 cfs) shall only be authorized upon issuance of a final order approving a Water Management and Conservation Plan (WMCP) under OAR Chapter 690, Division 86 that authorizes access to a greater rate of appropriation of water under the permit consistent with OAR 690-086-0130(7). The

required WMCP shall be submitted to the Department within 3 years of this Final Order. The amount of water used under Permit G-7593 must be consistent with this and subsequent WMCP's approved under OAR Chapter 690, Division 86 on file with the Department.

The Development Limitation established in the above paragraph supersedes any prior limitation of the appropriation of water under Permit G-7593 that has been established under a prior WMCP or Extension final order issued by the Department.

The deadline established in the Extension Final Order for submittal of a WMCP shall not relieve a permit holder of any existing or future requirement for submittal of a WMCP at an earlier date as established through other orders of the Department. A WMCP submitted to meet the requirements of the final order may also meet the WMCP submittal requirements of other Department orders.

DATED: November 14, 2017

Dwight French
Water Right Services Division Administrator

If you have any questions, please check the information box on the last page for the appropriate names and phone numbers.

Proposed Final Order Hearing Rights

1. Under the provisions of OAR 690-315-0100 and 690-315-0060, the applicant or any other person adversely affected or aggrieved by the proposed final order may submit a written protest to the proposed final order. The written protest must be received by the Water Resources Department no later than **December 29, 2017,** being 45 days from the date of publication of the proposed final order in the Department's weekly notice.

2. A written protest shall include:
   a. The name, address and telephone number of the petitioner;
   b. A description of the petitioner's interest in the proposed final order and if the protestant claims to represent the public interest, a precise statement of the public interest represented;
   c. A detailed description of how the action proposed in the proposed final order would adversely affect or aggrieve the petitioner's interest;
   d. A detailed description of how the proposed final order is in error or deficient and how to correct the alleged error or deficiency;
   e. Any citation of legal authority supporting the petitioner, if known;
   f. Proof of service of the protest upon the water right permit holder, if petitioner is other than the water right permit holder; and
   g. The applicant or non-applicant protest fee required under ORS 536.050.

3. Within 60 days after the close of the period for requesting a contested case hearing, the Director shall:
   a. Issue a final order on the extension request; or
   b. Schedule a contested case hearing if a protest has been submitted, and:
      1) Upon review of the issues, the Director finds there are significant disputes related to the proposed agency action; or
      2) The applicant submits a written request for a contested case hearing within 30 days after the close of the period for submitting protests.

Notice Regarding Service Members: Active duty service members have a right to stay proceedings under the federal Service Members Civil Relief Act. 50 U.S.C. App. §§501-597b. You may contact the Oregon State Bar or the Oregon Military Department for more information. The toll-free telephone number for the Oregon State Bar is: 1 (800) 452-8260. The toll-free telephone number of the Oregon Military Department is: 1 (800) 452-7500. The Internet address for the United States Armed Forces Legal Assistance Legal Services Locator website is: http://legalassistance.law.af.mil

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- If you have any questions about statements contained in this document, please contact Jeffrey Pierceall 503-986-0802.
- If you have questions about how to file a protest or if you have previously filed a protest and you want to know the status, please contact Patricia McCarty at 503-986-0820.
- If you have any questions about the Department or any of its programs, please contact our Water Resources Customer Service Group at 503-986-0801.
- Address any correspondence to: Water Right Services Division
  725 Summer St NE, Suite A
- Fax: 503-986-0901 Salem, OR 97301-1266

Municipal or Quasi-Municipal

Extension PFO Checklist for Water Use Permits

issued on or prior to November 2, 1998

(OAR 690-315-0010 through OAR 690-315-0060)

Application: G -8476 Permit: G- 7593 Permit Amendment? No☐ Yes☐ T-10055

Permit Holder's Name: City of Banks

Permit Holder's Mailing Address: 13680 NW Main St., Banks, OR 97106

Phone Number 503-324-5112

POD Location: Township 2N Range 3W Section 31 ¼¼ NENW

Drainage Basin: 2C County: Washington Watermaster District: 18

Date Permit was issued: 12/2/77 **Priority Date:** 9/29/77 **Date of PN:** 10/10/17

Source: a well in West Fork Dairy Creek Basin

Use: ☒ Municipal

"Q": 0.67

Orig "A" Date: 12/1/1978 **Orig "B" Date:** 10/1/79 **Orig "C" Date:** 10/1/1980

Extension request received: 10/2/17 **"B" Date:** Last Authorized 10/1/2017 **"C" Date:** Last Authorized 10/1/2017

Request Number (1, 2, 3...): 2 **"B" Date:** Proposed 10/1/2027 **C Date:** Proposed 10/1/2027

Conditions of Permit:

Condition Met?	Condition Not Met?	Permit Condition
yes		WMCP

Factors to consider in determining "Reasonable Diligence" [OAR 690-315-0080(4)]:

Yes No

☒ ☐ Work was accomplished within the time allowed in the permit or previous extension

☒ ☐ Water right permit holder conformed with the permit or previous extension conditions

☒ ☐ Beneficial use made of the water during the permit or previous extension time limits

- Permit holder has beneficially used 0.613 cfsF Undeveloped portion 0.057 cfs

-need this to be clarified.

☒ ☐ Financial investments were made toward developing the beneficial water use.

- Amount Invested to date: $2,817,451.99 Estimated Remaining Cost: $ 941,500

GW REVIEW: Y (N) 2nd Ext after 2005

MITIGATION REVIEW: Y (N)

Has the applicant pursued perfection of the right in good faith and with reasonable diligence? Yes ☒ No ☐

Population 1,785 **As of (Year)** 2016 ☐**Growth** 2.3 % ☐**Population** 2,811 **Projected by (Year)** 2030 **Calculated?** Yes ☐

Peak Demand 0.39 **cfs As of (Year)** 2016 ☐**Peak Demand** 2.19 **cfs Projected by (Year)** 2027 **Calculated?** Yes ☐

App using different measurement methodology

Application ___ - _____ Permit ___ - _____ Township _____ Range _____ Section _____

For MUNICIPAL permit ONLY. Maintaining persistence of state or federal listed fish species:

Yes	No	
☒	☐	Is this a Municipal use Permit? (If **YES**, proceed. If **NO**, skip to "Good Cause")
☒	☐	Was this permit issued on or prior to 11/2/98? (If **NO**… **STOP**. You are using the wrong form. Use *PFO Checklist MU/QM for permits issued after 1/2/98.*
☐	☒	Has full "Q" been beneficially used? (If **YES**, skip to "Good Cause")
☐	☒	Is this the first extension issued since 6/29/05 (*effective date of HB 3038*)? (If **NO,** skip to "Good Cause" *[refer to OAR 690-315-0080(1)(f)]*
☐	☐	If YES to above items, has ODFW reviewed extension application?
☐	☐	Has ODFW recommended adding any conditions to the Extension PFO?
☐	☐	Does the permit holder have any existing fish protection agreement with a state or federal agency? *(Refer to ODFW's review for this determination* _____ *)*

Based on the written record, can the Department make a finding of "Good Cause" to approve the extension request?

Yes... "Good Cause" can be found. ☒ Approval of Extension Request

No ... "Good Cause" *cannot* be found. ☐ Denial of Extension Request

Conditions to be included in Extension PFO (if applicable)? Yes ☐ No ☐

***(NOTE:** Check the file record for documentation to add a condition(s) at the extension stage.)*

☒ Max "Q" Development Limitations and Div. 856 Water Management and Conservation Plan

☐ Other: _____

Footnote regarding Claim of Beneficial Use. Choose the appropriate language below and insert as a footnote in the PFO:

☒ **COBU Requirement - Surface/Ground Water - on or prior to July 9, 1987**

"For permits applied for or received on or before July 9, 1987, upon complete development of the permit, you must notify the Department that the work has been completed and either: (1) Hire a water right examiner certified under ORS 537.798 to conduct a survey, the original to be submitted as required by the Water Resources Department, for issuance of a water right certificate; or (2) Continue to appropriate water under the water right permit until the Water Resources Department conducts a survey and issues a water right certificate under ORS 537.250 or 537.625."

☐ **COBU Requirement - Surface Water - post July 9, 1987**

"Pursuant to ORS 537.230(4), upon the completion of beneficial use of water allowed under the permit, the permit holder shall hire a certified water rights examiner to survey the appropriation. Within one year after the complete application of water to a beneficial use (or by the date allowed for the complete application of water to a beneficial use), the permittee shall submit a map of the survey and the claim of beneficial use."

☐ **COBU Requirement - Ground Water - post July 9, 1987**

"Pursuant to ORS 537.630(4), upon the completion of beneficial use of water allowed under the permit, the permit holder shall hire a certified water rights examiner to survey the appropriation. Within one year after the complete application of water to a beneficial use (or by the date allowed for the complete application of water to a beneficial use), the permittee shall submit a map of the survey and the claim of beneficial use."

NOTES: Previous Ext Approved in 2008. No Fish Per. Review Reqired

Extension "PFO" Dates

Mailing / Issuance Date: _____ **Protest Deadline Date:** _____

Reviewer's Name: JP **Date:** Oct 9, 2017

Print Report

Oregon Water Resources Department
Attribute Report

Report Date: Oct 9, 2017

General:

TRSQQ:	WM2.00N3.00W30SWSW WM2.00N3.00W30SESW WM2.00N3.00W31NWNW WM2.00N3.00W31NENW WM2.00N3.00W30SWSE WM2.00N3.00W31NWNE
DLC:	-
Latitude:	45.6211839452
Longitude:	-123.1065462067
Buffer (ft):	1000
Elevation (ft):	220
Basin Name:	Willamette
Basin Plan:	2C (8)-Lower Willamette (Tualatin)
County:	Washington
WM District:	18
WM Region:	NORTHWEST
ODFW Region, District:	Northwest Region, NWWD-Coast Range Unit
Irrigation District AOI:	TUALATIN VALLEY IRRIGATION DISTRICT
Irrigation District, Other:	
Dams (Permit):	-
Water Rights:	Platcard for WM2.00N3.00W30 Platcard for WM2.00N3.00W30 Platcard for WM2.00N3.00W31 Platcard for WM2.00N3.00W31 Platcard for WM2.00N3.00W30 Platcard for WM2.00N3.00W31
Well Logs:	Logs for WM2.00N3.00W30 Logs for WM2.00N3.00W30 Logs for WM2.00N3.00W31 Logs for WM2.00N3.00W31 Logs for WM2.00N3.00W30 Logs for WM2.00N3.00W31

Rules:

Withdrawn Authority:	-
Groundwater Retricted:	-
GW Retricted Subunit:	-
GW ODEQ Management Area:	-
GW Umatilla Muni Wells (5mile):	-
Rule 4D:	Rules apply
Division 33 (Area, Watershed, species):	LOWER COLUMBIA, *Dairy Creek*, Pacific Lamprey, Western Brook Lamprey, Steelhead
Irrigation Season of Use:	**Tualatin River** Adj. Status: Adjudicated Subarea: undefined Irr. Season: May 1 to Sept 30 Duty: NaN Rate: 1/80
Water Quality Limited Pollutant 2012:	-
Fish Habitat 2014:	-
Is in Deschutes Study Area:	-

Deschutes Zone Impact:	-
Deschutes Zone Overlay:	-
Scenic Water Way:	-

Hydrography:

OWRD Streamcode:	02114003000480090020 - Unn Str
Waterbody Name:	-
HUC 10:	1709001003
HUC Watershed:	Dairy Creek
WAB Wshed Order:	8
WAB Analysis:	W FK DAIRY CR > DAIRY CR - AT MOUTH
Streamflow:	OWRD Opportunities: Good ODFW Needs: High Combined Priority: Priority
Gaging Station Data:	-

Sources:

General
Oregon Public Land Survey Quarter-quarters. Bureau of Land Management, Oregon Water Resources Department.. n.d. 1:24,000.
Donated Land Claims. Oregon Water Resources Department. January 1, 1995. 1:100,000.
Elevation. ESRI World Elevation. February 2000. 1:121,000.
OWRD Administrative Basins. Oregon Water Resources Department. January 1, 1995.
Oregon Counties. Bureau of Land Management (BLM), Oregon State Office.. January 1, 2008.
OWRD Watermaster Districts. Oregon Water Resources Department. March 31, 2014.
OWRD Regions. Oregon Water Resources Department. January 1, 1995.
ODFW Districts and Regions. Oregon Department of Fish and Wildlife. August 28, 2012.
Water Organizations Oregon Water Resources Department. April 1, 2013. 1:24,000.
Large Dams Inventory. Oregon Water Resources Department. August 12, 2014. 1:24,000.
Rules
Withdrawn Authority Areas. Oregon Water Resources Commission. January 1, 2007.
OWRD Groundwater Restricted Areas. Oregon Water Resources Department. October 5, 2016.
OWRD Groundwater Restricted Areas - Subunits. Oregon Water Resources Department. April 1, 2009.
ODEQ Groundwater Management Areas (GWMAs). Oregon Department of Environmental Quality. April 21, 2008.
Groundwater Umatilla Municipal Wells 5-mile buffer. Oregon Water Resources Department. June 28, 2012.
National Marine Fisheries Service (NMFS) 4(d) Rule. National Marine Fisheries Service. January 1, 2007.
OAR Chapter 690, Division 33 - HUC 10 . Oregon Department of Fish & Wildlife. January 1, 2003.
Irrigation Season of Use. Oregon Water Resources Department, 2017.. March 24, 2017.
Oregon Water Quality Assessment 2012. This data set was assembled by the Oregon Department of Environmental Quality, Water Quality Division, Standards and Assessments Section.. December 4, 2014. 1:2,500,000.
Oregon Fish Habitat 2014. Oregon Department of Fish and Wildlife. Numerous fisheries biologists from ODFW as well as other natural resource agencies and tribes have contributed toward the development of these data. Data originator names are attributed at the feature level.. n.d. 1:24,000.
Deschutes USGS Groundwater Study Area. Water Resources Commission, U.S. Geological Survey (USGS) Water Resources Division (Portland, OR), Oregon Water Resources Department.. January 1, 2001. 1:100,000.
Deschutes Zones of Impact. Oregon Water Resources Department.. October 25, 2007.
Deschutes Zones Overlay. Oregon Water Resources Department. October 25, 2007.
Oregon State Scenic Waterway areas. Oregon Water Resources Department, Oregon Parks and Recreation Department.. January 1, 2007.

Hydrography
Routed OWRD Streamcodes (conflated to the NHD). Oregon Water Resources Dept.. August 11, 2014.
OWRD Lake Streamcodes (conflated to the NHD). Oregon Water Resources Dept.. August 7, 2015.
Watershed Boundary Dataset (WBD), 10-digit (watershed). Pacific Northwest Hydrography Framework, U.S. Geological Survey (USGS), National Resources Conservation Service (NRCS).. June 11, 2014. 1:24,000.
Water Availability Basins. Oregon Water Resources Department.. n.d. 1:100,000.
Priority Watersheds for Streamflow Restoration. Oregon Water Resources Dept. and the Oregon Dept. of Fish & Wildlife.. January 15, 2004.
Stream Gage Stations. Oregon Water Resources Department and US Geological Survey. n.d.

close

Print Report

Oregon Water Resources Department
725 Summer Street NE, Suite A
Salem Oregon 97301-1266
(503) 986-0900
www.wrd.state.or.us

Application for Extension of Time for Municipal and Quasi-Municipal Water Use Permits

Make use of this form, *Application for Extension of Time for Municipal and Quasi-Municipal Water Use Permits*, only if the permit uses the word "Municipal" or "Quasi-municipal" in the description of the purpose or use to which water is to be applied.

TO THE DIRECTOR OF THE OREGON WATER RESOURCES DEPARTMENT

A separate extension application must be submitted for each permit as per OAR 690-315-0070(2). This page, with an original signature by the permit holder of record, must accompany the extension of time application.

This application and a summary of review criteria and procedures that are generally applicable to this application are available at http://www.wrd.state.or.us/OWRD/PUBS/forms.shtml

I, City of Banks
NAME OF PERMIT HOLDER *[OAR 690-315-0070(1) and (3)(a)]*

Jolynn Becker
NAME OF CONTACT

13680 NW Main Street	Banks	OR	97106
ADDRESS	CITY	STATE	ZIP

(503) 324-5112
PHONE

E-MAIL ADDRESS

the permit holder of: Application Number G-8476

Permit Number G-7593
[OAR 690-315-0070(3)(b)]

do hereby request that the time in which to:

☒ complete construction (of diversion/appropriation works and/or purchase and installation of the equipment necessary to the use of water), which time now expires on October 1, 2017, be extended to October 1, 2027,

and/or the time in which to:

☒ apply water to full beneficial use under the terms and conditions of the permit, which time now expires on October 1, 2017, be extended to October 1, 2027.

I am the permittee, or have written authorization from the permittee, to apply for an extension of time under this permit. I certify that the information I have provided in this application is true and correct to the best of my knowledge.

Signature 9-29-17 Date

Before submitting, make sure the following items are included:

- Completed Application for Extension of Time
- Statutory fee of $575 (ORS 536.050). On July 1, 2017 the fee will increase to $670. Application received after 5:00 p.m. FRIDAY JUNE 30, 2017, without the correct fee of $670.00 will be returned.
- Signature page (page 1 of application) for Application for Extension of Time
- All supporting documentation and/or evidence referenced in the Application for Extension of Time

MAIL COMPLETED APPLICATION

along with the

STATUTORY FEE (ORS 536.050) TO:

Water Resources Department
Attn: Water Right Permit Extensions
725 Summer Street NE, Suite A
Salem, Oregon 97301-1266

GENERAL TIPS:

- A separate Application for Extension of Time must be submitted for each permit. OAR 690-315-0070(2).

- Request the reasonable amount of time necessary to fully develop the permit and complete the project. If you don't request enough time, OWRD may be unable to find that you can complete the project within the time requested.

- Permit extensions for Municipal and Quasi-Municipal permits are evaluated under OAR Chapter 690, Division 315. Except under limited circumstances (see OAR 690-315-0090), upon issuance of an order approving an extension of time, the permit holder will be required to submit a Water Management and Conservation Plan (WMCP) under OAR Chapter 690, Division 86 within 3 years. Diversion of water beyond the maximum rate currently diverted under the permit shall only be authorized upon approval of a WMCP. These rules may be viewed at: http://www.wrd.state.or.us/OWRD/LAW/index.shtml.

- The Application for Extension of Time includes detailed tips and instructions to help you respond to each item of the application. Oregon water law and administrative rules require the OWRD to consider each of these items when reviewing a municipal or quasi-municipal water use Application for Extension of Time. However, please feel free to provide OWRD with any additional information or evidence that will aid us in making our decision. Please note that OWRD may require other information that is necessary to evaluate the application. OAR 315-0070(3)(p).

- After careful review of the Application for Extension of Time, you may contact OWRD at (503) 986-0900, to ask questions and request assistance from a Permit Extensions Specialist in the Water Rights and Adjudications Division.

- Once an Application for Extension of Time is received by OWRD, it will be reviewed for completeness. OWRD will return any incomplete or deficient applications to the applicant. OAR 690-315-0080(1)(a).

Reference Materials Needed to Complete this Application

Below is a listing of the items that must be reviewed and considered when completing an Application for Extension of Time for a Municipal or Quasi-Municipal water use permit:

- The subject water right permit. If needed, a copy of the water right permit can be downloaded from the Department's Website at http://apps.wrd.state.or.us/apps/wr/wrinfo/ (the link to the Water Rights Information System (WRIS). Or, a copy of the permit (or other documents) may be requested by water right application number from the Water Rights Division at 503-986-0900 (copy fees will apply).

- Water Management and Conservation Plan (OAR Chapter 690, Division 86), *if applicable*, per OWRD.

- Water System Master Plan, *if applicable*, per Oregon Health Division.

- Documentation which demonstrates compliance with permit conditions (for example, well construction logs; static water level measurement reports; annual water use reports; a long-term alternative water supply plan; a plan to monitor the effect of water use on ground water aquifers utilized under the permit, etc.).

- All other water rights (certificates, permits, permit amendments, transfers, and/or new applications) held by the applicant.

Definitions Pertinent to this Application for Extension of Time

Actual Construction - any physical work performed toward completion of the water system which demonstrates the water right permit holder's good faith and intention to complete the project with reasonable diligence. Actual construction does not include planning a diversion system, formulating a business plan, securing financing, letting contracts, purchasing but not installing equipment, or surveying. This definition applies to quasi-municipal permit holders, required under the applicable statute, and for municipal water use permits issued on or after June 29, 2005. OAR 690-315-0070(3)(c) and (d), and OAR 690-315-0020(3)(d)(A)and(B).

C-Date – the date specified in the permit for complete application of water.

Permitted Time Period - period of time between the date when the permit was signed *and* the date specified in the permit for complete application of water

Time Period of the Previous Extension – *For the 2nd Application for Extension of Time* - period of time between the date specified in the permit for complete application of water and the new "extended to date" for complete application of water specified in the 1st approved extension.

For the 3rd, 4th, or . . . nth Application for Extension of Time - period of time between the "extended from date" for complete application of water and the "extended to date" for complete application of water specified in the most recently approved extension.

Undeveloped Portion of the Permit - the portion of the permit that is the difference between the maximum rate, or duty if applicable, specified in the permit and the maximum rate, or duty if applicable, diverted for beneficial use by the C-date or the last "extended to" date for complete application of water from the most recent prior extension. *(Oregon Court of Appeals A147071 WaterWatch vs OWRD & City of Cottage Grove, 2013)*

Work and Actions Accomplished - includes both physical work and other activities associated with the development of the water right, such as: water management planning; conservation planning; development of a water master plan for the Oregon Health Division; planning of a diversion system; demand forecasting; flow or water quality monitoring; source evaluation; entry into intergovernmental agreements for water delivery; property acquisition; engagement in governmental permitting or project financing; procurement of planning, design or construction services; surveying; and any physical work performed toward completion of the system and development of the right (e.g., pumps; pipes; well construction; treatment plant/facilities; transmission systems; distribution systems; and/or intake structures). OAR 690-315-0080(4).

Completing the Extension of Time Application for Quasi-Municipal or Municipal Use Permits

Please provide the information requested by item numbers 1-13. OWRD will use this information to evaluate your Application for Extension of Time.

TIP: *When making a reference to any document, report, and/or plan:*

(1) reference the source document along with any page number(s), table(s) and/or chart(s) used in the response, and

(2) include a copy of the source document (or appropriate pages) with the extension application.

[OAR 690-315-0070(3)]

1. **Submit the appropriate extension of time fee ($670), as specified under ORS 536.050.** If the extension application fee has already been paid, please provide indicate why and when it was paid. *The statute for this fee may be viewed at http://www.oregonlegislature.gov/bills_laws/lawsstatutes/2013ors536.html*

[OAR 690-315-0070(3)(c)]

2. **For Quasi-Municipal water use permit holders, provide evidence of the actions taken to begin actual construction on the project if required under the applicable statute.** All Quasi-Municipal permits issued prior to October 23, 1999, are generally required to begin actual construction within one (1) year.

TIP: *See Definition of "Actual Construction"*

Begin Date: _____. Construction of _____ began.
(month/year) (details)

[OAR 690-315-0070(3)(d)]

3. **For Municipal water use permits issued on or after June 29, 2005, evidence of the actions taken to begin actual construction on the project.**

TIP: *See definition of "Actual Construction"*

Begin Date:____. Construction of _____ began.
(month/year) (details)

[OAR 690-315-0070(3)(e) and OAR 690-315-0070(3)(i)]

4. **Provide a description of financial expenditures and evidence of actions taken to develop the water right permit within the permitted time period and, if applicable, within the**

time period of the most recent extension granted. ***Present the list in chronological order in Chart-I.***

TIP: *See definitions of "Permitted Time Period", "C-Date", "Time Period of the Previous Extension", "Actual Construction" and "Work and Actions Accomplished".*

CHART-I

INSERT DATES	ALL WORK AND ACTIONS ACCOMPLISHED BEFORE PERMIT WAS ISSUED *List work/actions done before the permitted was issued – e.g. Well drilled.*	COST
8/16/1977	A.M. Jannsen Drilling Co. began drilling the Behrman Well	Unavailable
8/24/1977	A.M. Jannsen Drilling Co. completed drilling Behrman Well (Exhibit C)	Unavailable
9/29/1977	City of Banks filed Application No. G-8476 for a Permit to Appropriate Ground Water (Exhibit B)	$35.00
INSERT DATES	**ALL WORK AND ACTIONS ACCOMPLISHED DURING PERMITTED TIME PERIOD (after permit was issued and prior to permit "C-date")** *List work/actions done during the permitted time period.*	**COST**
12/2/1977	**Date the permit was signed** - find date above signature on last page of permit.	N/A
12/2/1978	**Date the permit specified "Actual Construction Work" shall begin ("A-Date")** - not all permits contain this date.	**N/A**
1979	City of Banks completed development of Behrman Well, including construction of well house and piping assembly.	$48,000 (estimate)
10/1/1980	**Date the permit specified complete application of water to the use shall be made ("C-Date")** - all permits contain this date.	
INSERT DATES	**ALL WORK AND ACTIONS ACCOMPLISHED AFTER PERMIT "C-Date" and PRIOR TO THE MOST RECENT EXTENSION OF TIME REQUEST** *For the 1st Application for Extension of Time: List work/actions done after the permit "C-date" up to the date of this extension request.* *For Other than the 1st Application for Extension of Time: List any work/actions done after the permit C-Date but prior to the most recent extension.*	**COST**
1983	"Engineering Investigation of the Banks Water System and a Master Plan for Future Development" prepared for the City of Banks by Klein Consulting Engineers. (Banks' 2001 WMCP 1-2 (attached to 2007 Application for Extension of Time))	Unavailable
1994	Completed construction of Carsten Reservoir Tank No. 1 (500,000 gallons). (2001 WMCP Table 3-2 (attached to 2007 Application for Extension of Time))	$342,000
4/15/1994	"Preliminary Engineering Report for a Slow Sand Filter Water Treatment Plant" prepared for the City of Banks by Robert E. Meyer Consultants, Inc. (Banks' 1995 WSMP, 13 (attached to 2007 Application for Extension of Time))	Unavailable
12/1/1994	"Hydrogeologic Investigation, Water Resources Development" prepared for the City of Banks by Squier Associates to evaluate the ground water resources in the area surrounding the City of Banks. (1995 WSMP, Appendix B (attached to 2007 Application for Extension of Time))	Unavailable
2/1995	City of Banks Water System Master Plan prepared by Robert E. Meyer Consultants, Inc. (Exhibit E, 2011 WSMP 1-1)	Unavailable
1997	City constructed 12-inch water main loop and 8,000 lineal feet of 8-inch distribution piping to serve customers in new developments. (2001 WMCP 3-7 (attached to 2007	$190,000 to

	Application for Extension of Time))	$300,000 (estimate)
9/1998	City of Banks Water System Master Plan Update prepared by Bookman-Edmonston Engineering, Inc. (Exhibit E, 2011 WSMP 1-1)	Unavailable
1999	Completed construction of Carsten Reservoir Tank No. 2. (1,000,000 gallons) (2001 WMCP Table 3-2 (attached to 2007 Application for Extension of Time))	$343,000
2000	City of Banks added new telemetry and meters to monitor the production rate of the Behrman Well. (2001 WMCP 3-5 (attached to 2007 Application for Extension of Time))	$25,000
1/2001	Water management and Conservation Plan prepared for the City of Banks by LDC Design Group, Inc. (2001 WMCP (attached to 2007 Application for Extension of Time))	$70,000 (estimate)
2001	Purchase Kelly Field.	$415,000
1996-2001	Replaced well pump. (2001 WMCP 3-5 (attached to 2007 Application for Extension of Time))	Unavailable
2002	Install new line from Well to Reservoir.	$19,000
3/22/2005	City began and completed drilling Well #2.	$113,400
1/28/2005	City filed Permit Amendment Application T-10055 to add Well # 2 as an additional point of appropriation under Permit G-7593. (Exhibit A)	$350.00
2006	City implemented new water billing system.	$11,000
	CHART-I (continued)	
INSERT DATES	**ALL WORK AND ACTIONS ACCOMPLISHED DURING THE MOST RECENT EXTENSION OF TIME GRANTED** *For Other than 1st Application for Extension of Time: List any work/actions done during the time period most recent extension.*	**COST**
11/20/2008	**Date of the last "Extended From Date" for complete application of water (used on the most recently approved extension of time).**	
2009-2010	Water Conservation Program- Repair fire hydrant, install/ maintain meters, add metering zones to identify leaks, repair leaks, master plan update, replacing sand in well, SCADA updates, new turbidmeters. (Exhibit G)	$6,707.53
2010-2011	Water Conservation Program- Repair fire hydrant, install/ maintain meters, add metering zones to identify leaks, repair leaks, master plan update, replacing sand in well, SCADA updates, new turbidmeters. (Exhibit G)	$41,405.37
2011-unknown	Well No. 2 backup supply. (Exhibit F and Exhibit E, WSMP section 6)	$670,000
2011-unknown	SSF site upgrades, creation of intermediate pressure zone. (Exhibit F and Exhibit E, WSMP section 6)	$270,000
2011-unknown	Clearwell flow and level control. (Exhibit F and Exhibit E, WSMP section 6)	$25,400
2011-unknown	Behrman well site upgrades. (Exhibit F and Exhibit E, WSMP section 6)	$220,000
2011-2012	Water Conservation Program- Repair fire hydrant, install/ maintain meters, add metering zones to identify leaks, repair leaks, master plan update, replacing sand in well, SCADA updates, new turbidmeters. (Exhibit G)	$23,747.59
2012	SSF filter capacity study and additional transmission line controls.	$6,000
2012-2013	Water Conservation Program- Repair fire hydrant, install/ maintain meters, add metering zones to identify leaks, repair leaks, master plan update, replacing sand in well, SCADA updates, new turbidmeters. (Exhibit G)	$503
2013-2014	Water Conservation Program- Repair fire hydrant, install/ maintain meters, add metering zones to identify leaks, repair leaks, master plan update, replacing sand in	$4,175

	well, SCADA updates, new turbidmeters. (Exhibit G)	
2014-2015	Water Conservation Program- Repair fire hydrant, install/ maintain meters, add metering zones to identify leaks, repair leaks, master plan update, replacing sand in well, SCADA updates, new turbidmeters. (Exhibit G)	$24,285
2015-2016	Water Conservation Program- Repair fire hydrant, install/ maintain meters, add metering zones to identify leaks, repair leaks, master plan update, replacing sand in well, SCADA updates, new turbidmeters. (Exhibit G)	$17,530
2016-2017	Water Conservation Program- Repair fire hydrant, install/ maintain meters, add metering zones to identify leaks, repair leaks, master plan update, replacing sand in well, SCADA updates, new turbidmeters. (Exhibit G)	$26,413
2017-2018	Water Conservation Program- Repair fire hydrant, install/ maintain meters, add metering zones to identify leaks, repair leaks, master plan update, replacing sand in well, SCADA updates, new turbidmeters. (Exhibit G)	$4,500
10/1/2017	**Last "Extended To" date for complete application of water (resulting from the most recently approved extension of time).**	
INSERT DATES	**ALL WORK AND ACTIONS ACCOMPLISHED AFTER THE MOST RECENT EXTENSION OF TIME GRANTED** *List work/actions done after the last authorized date for complete application of water has passed.*	**COST**
	Total Cost to Date	**$2,817,451.99**

[OAR 690-315-0070(3)(f)]

5. Provide evidence of compliance with conditions contained in the original permit, in any previous extension(s), and/or in any permit amendments (Chart II), or the reason the condition was not satisfied (Chart III).

Conditions requiring a response in the extension of time application include those which:

- Stipulate a specific date by which the permit holder was to accomplish a specific action, such as a condition that requires plans and specifications for a reservoir, a Water Management and Conservation Plan, a ground water monitoring plan or some other document which "...shall be submitted...within two years of permit issuance." If your permit requires submittal of a Water Conservation and Management Plan, please indicate the date the plan was submitted to or approved by OWRD, or whether it is still being drafted, etc.;

  and/or

- Are triggered by the use of water, but do not stipulate a specific date. These conditions represent a milestone in development of the project and use of water, such as the permit holder, "shall install...a water meter or other suitable measuring device approved by the Director...before any use of water begins." Another common condition triggered by the use of water is that; "fish screens are to be installed according to Oregon Department of Fish and Wildlife specifications."

TIP: *Any supporting documentation submitted to demonstrate compliance with time-sensitive permit conditions or any conditions from prior permit extension(s) must be clearly referenced and may*

include, but is not limited to: well construction logs; static water level measurement reports, annual water use reports; a Water Management and Conservation Plan; an alternative long-term water supply plan; and/or a plan to monitor the effect of water use on ground water aquifers utilized under the permit. If needed, please contact OWRD for assistance in identifying and/or interpreting which conditions in the water permit are pertinent to the Application for Extension of Time.

5-A) Describe how each condition has been complied with. Include conditions contained in the original permit (and, if applicable, each condition contained in any order approving a permit amendment and/or a final order approving a prior extension of time). Include the date when the condition was satisfied.

CHART-II

Condition No.**	Date Satisfied	Describe How Permit Condition Has Been Satisfied
1	2011	An airline and pressure gauge (or) access port for measuring line was installed to determine water level elevation in the well at all times.
2	Ongoing	The City installed an appropriate measuring device and has consistently compiled a record of the amount of ground water withdrawn from the Behrman Well. The City has submitted water use reports to OWRD for this permitted withdrawal since at least 1988. (Exhibit H)
3	8/10/2010	The City completed a Water Management Conservation Plan by November 20, 2011 as was required by OWRD in the Final Order for Extension of Time for Permit G-7593 (Exhibit B)

** *Condition No: Attach a copy of the permit and, if applicable, any prior permit extensions or permit amendments with conditions identified and hand-numbered in a continuous number sequence throughout all such documents. Responses to Items 5-A and 5-B should reference each condition by number to correspond with the hand-written number sequence on the attached documents containing permit conditions.*

5-B) If applicable conditions have NOT complied with all, explain the reasons why and indicate with a date certain (in the near future) when compliance will occur.

CHART-III

Condition No.**	Date Will Comply	Explain Why Each Permit Condition Has NOT Been Satisfied

[OAR 690-315-0070(3)(g)]

6. Provide evidence of the maximum rate (or duty, if applicable) of water diverted for beneficial use under this permit. Report water use as of the C-Date in the permit, or as of the "extended to" date of the most recent prior extension of time (if any).

TIP: Documentary evidence substantiating the maximum instantaneous rate, or duty if applicable, of water appropriated may include, but is not limited to: water

meter records; dedicated electrical meter records; business records; and/or a sworn affidavit.

6-A) For Surface Water Permit Extensions:

TIP: *Report in the same units of measurement as specified in the permit. In this section, report only water use made under THIS permit:*

Maximum instantaneous rate (as of C-date or prior extension) = ___ cfs, *or*
(cubic feet per second)

Maximum instantaneous rate (as of C-date or prior extension) = ___ gpm, *or*
(gallons per minute)

Acre Feet stored (as of C-date or prior extension) = _____ AF

6-B) For Ground Water Permit Extensions:

TIP: *Include information from ALL wells that pertain to this permit, including drilled wells not currently used.*

CHART-IV

Well # as identified on Permit	Water User's Well #	Has this well been drilled?	IF DRILLED: Well Log Number E.g. MULT 60493	Well Tag Number E.g. # 40151 or N/A	Is the actual drilled location authorized on this permit or on a permit amendment? *(See below)*	Maximum instantaneous rate used by C-date or prior extension -- from this well -- under this permit only (CFS or GPM)	Is this well authorized or utilized under any OTHER water rights?	If yes, provide the rate used from this well under each water right. (Typically the total of all uses from a single well will not exceed the well's pumping capacity.) Permit, Certificate, or Transfer No.	Rate (CFS or GPM)
Well	Well 1	Yes ☒ No ☐	WASH 7651		Yes ☒ No ☐	.613 cfs (275 gpm)*	Yes ☐ No ☒	-	
								-	
		Yes ☐ No ☐			Yes ☐ No ☐		Yes ☐ No ☐	-	
								-	
		Yes ☐ No ☐			Yes ☐ No ☐		Yes ☐ No ☐	-	
								-	
		Yes ☐ No ☐			Yes ☐ No ☐		Yes ☐ No ☐	-	
								-	
Total instantaneous rate from all wells utilized under this permit used by C-date or most recent "extended to" date						.613 cfs			

*A July 14, 1993 letter from R.W. Klassen, in conjunction with the City's Final Proof Survey, and included within the Permit file, indicated that the maximum use reached 275 gpm (.613 cfs).

6-C) If the drilled location of a well is not authorized on this permit, please specify its location below, or provide a map showing its location. Has or will a permit amendment application been/be filed with OWRD? Yes ☐ No ☐

If a Permit Amendment Application has been filed: Transfer No. T-_____

Well #_____: Actual location: _____

Well #_____: Actual location: _____

[OAR 690-315-0070(3)(h)]

7. Provide an estimate of the current population served under this permit and a description of the methodology(ies) used to make the estimate.

Estimate the current population that is supplied water by the municipality or quasi-municipality and if applicable, current population served under this permit. Describe how that estimate was derived, or cite the source document from which the data was obtained. Include any calculations, formulas, supporting documentation, including copies of source documents.

Current Population: 1785 as of Year: 2016

Methodology used to estimate current population served:
Estimated City population is 1785 and the additional outside service area population is 305. (Exhibit D, WMCP Table 2-1).

[OAR 690-315-0070(3)(p)]

8. Report the current peak water demand of the current population served, and a description of the methodology(ies) used to make the estimate.

Identify the total rate, or duty if applicable, of water being used to meet the current peak demand for water from all water rights held by the municipal or quasi-municipal entity. This must be reported in the same units of measurement as specified in the permits, being cfs (cubic feet per second), gpm (gallons per minute), and/or AF (acre-feet – usually only specified on a reservoir right to store water). This total rate should be based on the information provided on "Attachment A" in the column named *"Max Amount of Beneficial Water Used to Date"* [under Item 10-A (a)].

Current Peak Water Demand: Maximum monthly demand = 0.39 cfs as of Year: 2016

Methodology used to estimate current peak demand:
The maximum monthly demand was determined from meter readings from water users and discharge from wells and the water treatment plant. Peak daily demand noted above in the maximum instantaneous rate is higher than the maximum monthly demand because the monthly demand is an average of daily pumping rates whereas the maximum instantaneous rate is a figure reflecting a daily peak demand.

[OAR 690-315-0070(3)(k)]

9. Provide a summary of any events that delayed completion of the water development or application of water to full beneficial use, including other governmental requirements (if

any), relating to the project that have significantly delayed completion of construction or perfection of the right.

TIP: *Such events may include, but are not limited to: the size and scope of the project; financing and/or cash flow issues; local referendums or initiatives; actual growth rates; economic downturns; loss of territory to annexation; water conservation efforts; the need to meet other governmental requirements relating to the project; natural disasters and severe weather; and/or any other events over which the water right permit holder had no control and which delayed development under the permit.*

Many events have delayed completion of the water development or application of water to full beneficial use under Permit G-7593. First, the Behrman Well performed below its original specifications and thus, the yield was less than expected. Accordingly, the City has been limited at times of peak demand to withdrawal of .613 cfs from the Behrman Well. Due to a number of reasons, including governmental requirements, technical difficulties, economic and financial issues, rapid growth, and severe weather, the City lacked the necessary resources to fully develop the remainder of Permit G-7593.

Technical difficulties: As noted, the City of Banks was unable to put the full 0.67 cfs of water to full beneficial use by the C-Date because the well performed below specifications. On August 25, 1977, the Behrman Well was test pumped for a 48 hour period, and the ensuing report by Klein Consulting Engineers indicated that the well could be pumped at a sustained rate of 300 gpm. However, the actual sustained pumping rate is somewhat less, and the City's only realistic and reasonable option to fully develop Permit G-7593 involved drilling an additional well. However, the City lacked the resources to do so, and for many years, the City could get by with the use of other sources to make up the difference at times of peak demand. However, a relatively recent explosion in growth has pushed the City's water system to capacity, and the City must fully utilize its current water permits and water rights to meet current and projected future demands.

Actual growth rates/peak demand: In general, the Behrman Well was developed to supplement the City's capacity during peak summer months. As a result, the Well is operated during the summer months to allow the City's water system to meet peak seasonal demands. (Exhibit D, WMCP at 6). However, recent rapid growth in the City has forced the City to rely more heavily on the Behrman Well and often the City is forced to exceed the recommended maximum daily running time of 18 hours per day to meet peak demands. (Exhibit D, WMCP at 6).

Economic Reasons: The City of Banks is a small municipality that operates on a tight budget. As the City's water system has aged, the City has expended significant financial resources maintaining and updating the current system, and investigating the most efficient and cost-effective methods of increasing the reliability of its water system. Accordingly, much of the work that was deemed necessary to ensure reliability of the current water system took precedence over developing the remainder of Permit G-7593. Such repairs and improvements have helped the City reduce leakage within the system, ensured the quality of the drinking water, and improved conservation methods within the City. The table accompanying Item #4 provides ample evidence of the public works

investment the City has made in recent years to improve its water system. In addition, the City has expended significant funds on legal and consulting fees for activities associated with its water system development, including acquiring necessary easements and related litigation.

Severe Weather: In February 1996, severe flooding and an accompanying mudslide irreparably damaged the City's intake structure at the Large Spring (Certificate 5353), requiring the City to spend over $189,000 building a replacement. (Exhibit D, WMCP at 13).

Government requirements: The City was also required to build a sand filtration plant in response to the Federal Surface Water Treatment Rule, enacted in 1986. Accordingly, the City commissioned an appropriate study and built a slow-sand filtration plant, which was completed in 1997 at a cost exceeding $635,000.

Additional Events: Increased logging activity on private land within the City's watershed put the City's water supply at risk of contamination. Accordingly, to protect the watershed, the City purchased "Kelly Field" in 2001 at a cost of $415,000 and replanted the property with trees at a cost of approximately $21,000.

In recent years, the City has hired multiple consultants to research and evaluate options for expanding capacity of the system, especially during times of peak demand. The City's WMCP and WSMP both recommended maximizing existing sources of supply, while at the same time evaluating additional sources. Because all other water use right sources are fully developed, the City desires an extension to complete beneficial use of Permit G-7593 and develop the remainder of the permitted amount that has not been put to beneficial years.

Most recently, the City and its consultants, applied for a transfer application (T-10055) in December 2005 to develop the remainder of the permitted amount under Permit G-7593. The Department issued deficiency letters in March 2007, which was never received by the City, and then in February 2012 based on its finding that an additional point of appropriation (Well 2) cannot be added to Permit G-7593. However, the City was delayed in responding to the deficiency letters because it never received the 2007 letter. The City has requested a recurring administrative hold from the Department to further research the issues articulated by the Department with adding Well 2 to Permit G-7593 and to engage in conversations with the Department to resolve the issue. The City desires to use Well 2 under Permit G-7593 to avoid the expense of drilling an additional well, which would be in excess of $100,000 and could potentially have the same production issues as Well 1. The City desires to use Well 2 as the additional point of appropriation under Permit G-7593 because Well 2 is already drilled and produces adequately to supply the City with the rest of its rate under Permit G-7593 therefore, it is most cost effective for the City to use Well 2 than to drill a new well. The City will be contacting the Department in the next month to request another meeting with the Department to discuss T-10055 and ways the City can work with the Department to obtain approval of the application and to discuss additional cost effective solutions.

[OAR 690-315-0070(3)(l)]

10-A. Provide an estimated demand projection and a description of the methodology(ies) used for the subject water right permit, considering the other water rights held by the municipal or quasi-municipal water use permit holder, and a date by which the water development is anticipated to be completed and water put to full beneficial use.

In developing your estimated demand projections for the permit being extended, you should include the following items:

a) Inventory of Water Rights Held

List all water rights held, including this permit, currently held by the permit holder. Use the format shown in "Attachment A" (see last page of this Application for Extension of Time). A link to the Water Rights Information System (WRIS), accessed through OWRD's website at http://apps.wrd.state.or.us/apps/wr/wrinfo/ may be a helpful source for compiling this information.

Use the "Use Limitations" column to identify and explain why any water right is not currently utilized to meet current peak water demands, or which is used only in a limited capacity.

TIP: Use limitations include any factors affecting the use of a water right, such as: used for system redundancy; used for emergency back-up water supply; climate patterns or turbidity result in seasonal unavailability; not used due to water quantity issues, etc.

Water rights inventory included in Exhibit A.

b) Water Supply Contracts and/or Agreements

List any water supply contracts or agreements for water that will be supplied by the permit holder to other entities.

N/A

List any water supply contracts or agreements for water that will be supplied from other entities that the permit holder will depend on to meet its own current or anticipated future water needs.

N/A

c) Projected Population

Identify the projected population growth rate. The population projection must be extended out, at a minimum, to the year requested for complete application of water. Describe the methodology used to create the population projections such as historical growth rates or any factors affecting growth trends.

Population Growth Rate: 2.3%

Projected Population: 2,811 as of Year: 2030

Methodology used to estimate projected population and population growth rate:

The City's current population estimates are derived from Portland State University Population Research Center's ("PRC") estimates, and were presented in Figures 1, 17, and 21 of the *Coordinated Population Forecast, 2017 through 2067, Washington County*. The PRC's methodology for its population estimates is explained in the report. (Exhibit I and available at https://www.pdx.edu/prc/sites/www.pdx.edu.prc/files/Washington_Report_2017_Final.pdf)

d) Future Peak Water Demands

Identify the projected peak water. The peak water demand projection must be extended out, at a minimum, to the year requested for complete application of water. Describe the methodology used to create the water demand projection, such as historical growth rates or any factors affecting growth trends. Include a summary of how the subject permit, and other water rights and /or supply contracts held by the permit holder are planned or expected to be used to meet anticipated future water needs

Projected Peak Water Demand: Maximum day demand = 2.19 cfs as of Year: 2028

Methodology used to estimate peak water demand:

Assuming water conservation measures from WCMP, the projected population and system demands in the WMCP estimate in 2028 the maximum day demand is 949 gpm (2.19 cfs). Per capita usage was multiplied by projected population growth from City planner to calculate that amount. (Exhibit D, WMCP Table 5-2)

e) Potential Growth

Describe the potential for growth of the service area (such as the annexation of lands or new industrial and/or commercial ventures locating within the service area) and describe how those projects are expected to affect future water demands.

The Banks City Planner estimates that full build out to the urban growth boundary will occur in 2024 based upon the estimated population growth. This rapid population growth will likely bring additional commercial ventures, both of which will rely on the City's water system. (Exhibit D, WMCP at ES-1 and Table 5-1)

f) Completion Date

Provide the date by which the water development is anticipated to be completed and water put to full beneficial use. **October 1, 2027**

[OAR 690-315-0070(3)(l)]

10-B. Application for Extension of Time requests for greater than 50 years must include documentation that the demand projection is consistent with the amount and types of lands and uses proposed to be served by the permit holder.

TIP: If you are requesting an extension of greater than 50 years, it is very important to provide all available documentation (including estimates, projections, other related information, and all associated data) supporting the position that the demand projection is consistent with the amount and type of lands and uses to be served by the permit holder.

Show that permit holder's potential for future growth and expansion is feasible and consistent with the amounts and types of lands and uses proposed to be served. Information that may be addressed includes, but is not limited to: land use plan(s); current service area(s) in relation to the urban growth boundary; amounts of lands currently un-served and available for future development; and/or low-density vs. high-density areas.

[OAR 690-315-0070(3)(j) and OAR 690-315-0070(3)(m)]

11. Provide an estimate of the costs to complete water development and summary of the future plan and schedule to complete construction and/or perfect the water right.

Considering the demand projections in Item 10-A, describe major future work and actions that must be accomplished in order to fully develop and perfect the subject permit. Provide a list of the major planning, work and/or actions needed, the approximate time frames, and estimated costs anticipated to complete the water development within the parameters of this permit.

The City's Updated Water System Capital Improvement Plan (CIP) (Exhibit F) outlines that the following infrastructure upgrades must be made to meet current and expected service demands: Water Conservation and Management Plan Update; Distribution System Looping and Upgrades; Source Water Protection Plan; Investigate Alternative Water Providers; and Water Master Plan Update. The City's need to investigate alternative water providers or sources of water stems from the inability of WASH 7651 to produce at the full rate identified in Permit G-7593. Therefore, the City will continue to pursue approval of its Transfer Application T-10055; however, if T-10055 is not granted, the City will have to apply for a permit amendment and drill a new well.

CHART-V

APPROXIMATE DATE RANGE	WORK AND ACTIONS TO BE ACCOMPLISHED	ESTIMATED COST
2019	Permit Amendment to add Point of Appropriation to Permit G-7593	**$1,500**
2019	Maintenance to water in-feed tank for Well 1	**$400,000**
2022	Develop and construct Well 3 as a new point of appropriation	**$250,000**
2022	Emergency Design and Planning	**$70,000**
2010-2024	Distribution System Looping & Upgrades	**$620,000**
Year: **2027**	Date intend to apply water to full beneficial use under the terms and conditions of this permit.	
Estimated Total Cost to Complete Development		**$941,500.00**

[OAR 690-315-0070(3)(n)]

12. Justify the time requested to complete the project and/or apply the water to full beneficial use.

A justification should integrate information from Items 5-B, 6-A or 6-B, 9, 10-A, and 11 of this application, and should include any other information or evidence to establish that the requested amount of time is reasonable, and that you will be able to complete the project within the amount of time requested.

The City has already expended considerable effort and money to develop Well #2, which would allow the City to fully develop Permit G-7593 within a short time period. The City requests until 2027 to complete construction and apply water to beneficial use to account for any unforeseen circumstances that may prevent the City from using Well #2 and completing beneficial use under Permit G-7593. Of course, the City cannot put Well #2 online until its Permit Amendment Application T-10055 is approved by the Department; however, the City has requested an administrative hold on T-10055 due to the City's ongoing discussions with the Department about how to resolve the Department's deficiency letter issued upon its review of T-10055. The City has new information that it has developed in conjunction with consultants who were retained to further research the issues the Department has cited for its inability to approve T-10055. The City anticipates presenting the new information to the Department by the end of the 2017.

[OAR 690-315-0070(3)(o)]

13. Provide any other information you wish OWRD to consider while evaluating the Application for Extension of Time

The City requests approval of the extension of time application to allow it to move forward with Permit Amendment T-10055 and bring Well #2 online under Permit G-7593. The addition of a second well will provide the City with the ability to fully perfect Permit G-7593, while improving the City's ability to meet peak demands and the operating reliability of the Behrman Well. Currently, the City is forced to operate the Behrman Well above recommended operating times, which places the water supply at risk and could reduce well yield. This extension application is an important part of the City's attempts to secure a safe and sufficient water supply for its citizens and to meet the demands that will be incurred by the City's population growth. The City submitted its previous application for an extension of time in 2007 and since that time the Department has informed the City that it will not approve T-10055. Therefore, the City has hired consultants to study the issues the Department highlighted as reasons to deny T-10055 and to establish a strategy to address the Department's concerns. The City has expended valuable City resources working with the consultants to address the Department's concerns and desires the opportunity to have further conversations with the Department about T-10055 to resolve the issue. The City places great importance upon the approval of T-10055 and has tried to take cost effective approaches to resolving the issue, keeping in mind the great expense that would be incurred if the City were required to drill a new well. Approval of this application for extension of time is critical to allowing the conversations between the City and the Department to continue.

[OAR 690-315-0070(3)(q)]

14. For Municipal water use permits issued before November 2, 1998, for the first extension issued after June 29, 2005, provide a copy of any agreements regarding use of the undeveloped portion of the permit between the permit holder and a federal or state agency that include conditions or required actions that maintain the persistence of listed fish species in the portions of the waterways affected by water use under the permit.

N/A

Exhibit A: City of Banks Additional Water Rights

Water Rights Inventory for (Name of Entity) City of Banks

(List of All Permits, Permit Amendments, Certificates, Transfers, New Applications)

Ground Water

Application No.	Permit No.	Priority Date	Certificate No.	P.A.[1] or Transfer No.	Source of water identified in water right	Facility Name used by entity	Use	Rate identified in water right (cfs or AF)	Actual Diverson: Maximum Instantaneous Rate Diverted to Date (cfs)	Authorized Completion Date[2]	Notes or Limitations to water use[3]
G-8476	G-7593	9/29/1977	N/A	T-10055*	A well, West Fork Dairy Creek		Municipal	.67 cfs	.613 cfs		Well produces lower than expected yield.

*T-10055 is a Permit Amendment requesting an additional point of appropriation for Permit G-7593.

Surface Water

Application No.	Permit No.	Priority Date	Certificate No.	P.A. or Transfer No.	Source of water identified in water right	Facility Name used by entity	Use	Rate identified in water right (cfs or AF)	Actual Diverson: Maximum Instantaneous Rate Diverted to Date (cfs)	Authorized Completion Date	Notes or Limitations to water use
S-9207	S-6516	10/3/1923	5353		Spring, tributary of Dairy Creek		Municipal	.42 cfs	.42 cfs		
S-65611	S-48173	8/25/1983	83138		Two unnamed Streams, tributaries of West Fork Dairy Creek		Municipal	.18 cfs	.18 cfs	10/1/2017	Season unavailability, high turbidity

[1] P.A. = Permit Amendment

[2] Date by which full application of water is to be made within the terms and conditions of the permit (date will be specified in the permit or on the last extension Final Order).

[3] If a particular water right certificate, permit, or transfer is not being utilized to meet current demands, or its use is somehow limited due to quality, seasonal, etc. limitations, or if a the actual diversion rate is less than a certificated rate, please explain why.

Pending New Water Right Applications

Application No.	Priority Date	Source	Proposed Use	Proposed Rate	Notes or Limitations to water use
G-15887 (Permit G-16312)	12/5/2002	A well, West Fork Dairy Creek Basin	Municipal	1 cfs	

Permit—21510—500—7-23.

STATE OF OREGON

COUNTY OF WASHINGTON

CERTIFICATE OF WATER RIGHT

This is to Certify, *That* City of Banks *of* Banks, *State of* Oregon, *has made proof to the satisfaction of the STATE ENGINEER of Oregon, of a right to the use of the waters of* Springs in SE¼NE¼ of Section 12, Township 2 North, Range 4 West, W. M., *a tributary of* Dairy Creek *for the purpose of* Municipal *under Permit No.* 6516 *of the State Engineer, and that said right to the use of said waters has been perfected in accordance with the laws of Oregon; that the priority of the right hereby confirmed dates from* October 3, 1923;

that the amount of water to which such right is entitled and hereby confirmed, for the purposes aforesaid, is limited to an amount actually beneficially used for said purposes, and shall not exceed 0.42 cubic foot per second;

The use hereunder for irrigation shall conform to such reasonable rotation system as may be ordered by the proper state officer.

The amount of water used for irrigation, together with the amount secured under any other right existing for the same lands, shall be limited to one-eightieth of one cubic foot per second per acre, or its equivalent in case of rotation.

A description of the lands irrigated under the right hereby confirmed, and to which such right is appurtenant (or, if for other purposes, the place where the water is put to beneficial use), is as follows: Southwest Quarter of the Southwest Quarter (SW¼SW¼) of Section Thirty (30), Township Two North, Range Three West of the Willamette Meridian, in Washington County, Oregon.

The right to the use of the water for irrigation purposes is restricted to the lands or place of use herein described.

Rights to the use of water for power purposes are limited to a period of forty years from the date of priority of the right, as herein set forth, subject to a preference right of renewal under the laws existing at the date of the expiration of the right for power purposes, as hereby confirmed and limited.

WITNESS the signature of the State Engineer, affixed this 2nd *day of* February, *1925.*

Rhea Luper,
State Engineer

Recorded in State Record of Water Right Certificates, Volume 6, *page* 5353.

Sketch showing

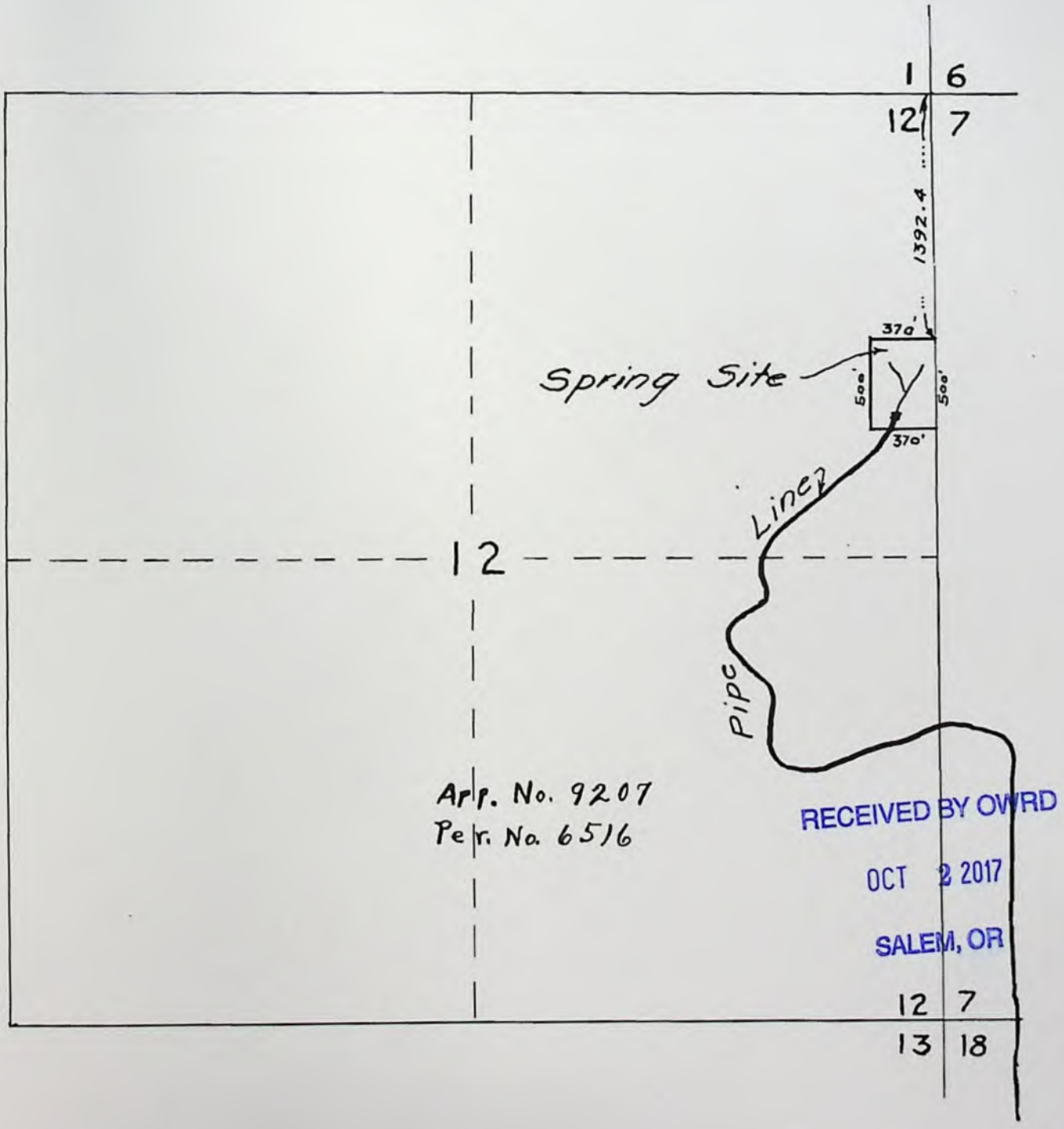
Location of Spring Site For

Water System

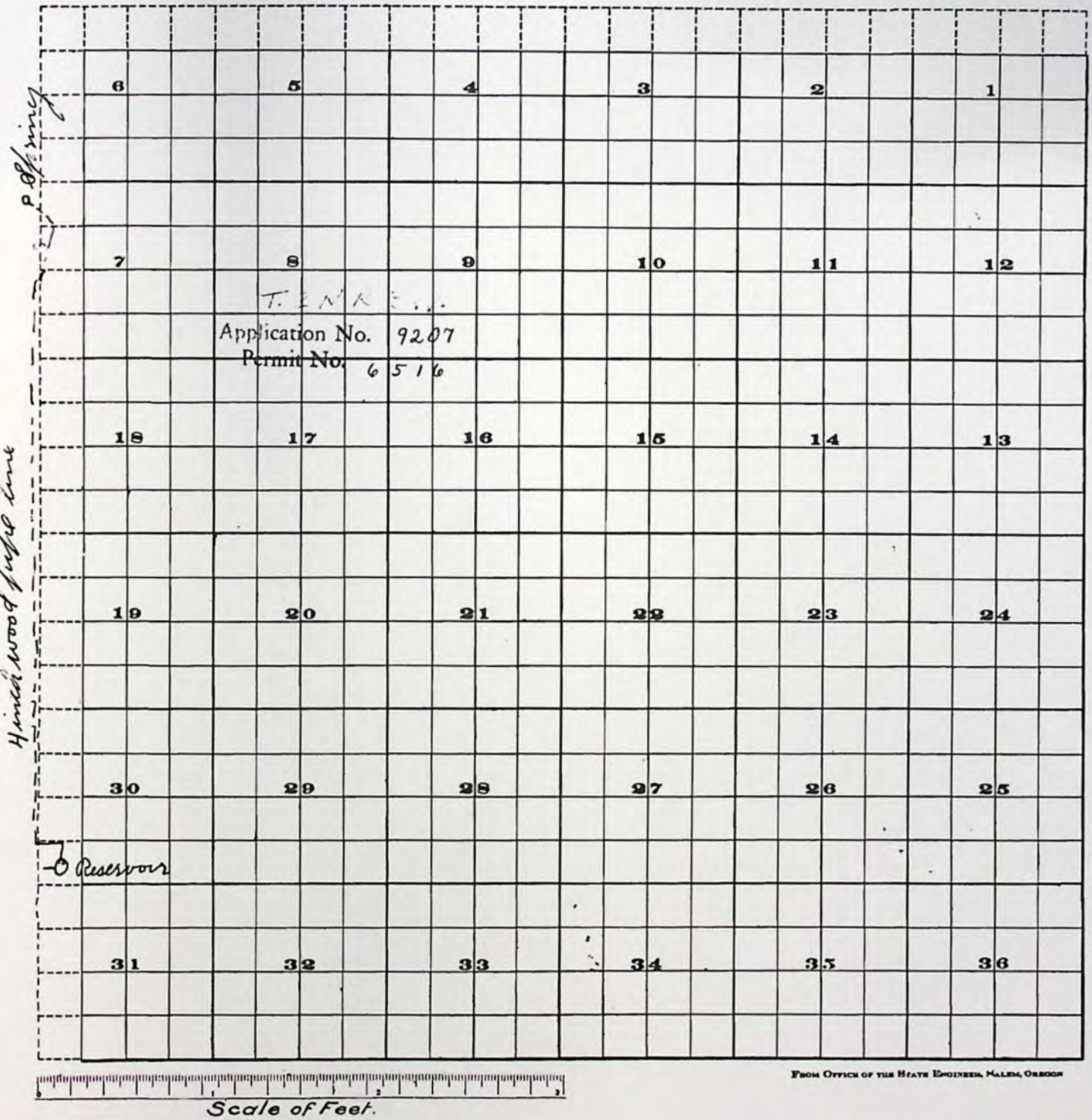
Banks, Ore.

June, 1924

Joe H. Pos
Engineer



Township 2 North, Range 3 West.



STATE OF OREGON

COUNTY OF WASHINGTON

CERTIFICATE OF WATER RIGHT

THIS CERTIFICATE ISSUED TO

CITY OF BANKS
150 NE BANKS RD
BANKS OR 97106

confirms the right to use the waters of TWO UNNAMED STREAMS for MUNICIPAL USES.

This right was perfected under Permit S-48173. The date of priority is AUGUST 25, 1983. The amount of water to which this right is entitled is limited to an amount actually used beneficially, and shall not exceed 0.180 CUBIC FEET PER SECOND, BEING 0.09 CUBIC FEET PER SECOND FROM EACH STREAM, or its equivalent in case of rotation, measured at the point of diversion.

The points of diversion are located as follows:

Twp	Rng	Mer	Sec	Q-Q	GLot	DLC	Survey Coordinates
2 N	3 W	WM	7	NW SW			290 FEET SOUTH AND 1090 FEET EAST FROM W1/4 CORNER, SECTION 7
2 N	3 W	WM	7	NW SW			280 FEET SOUTH AND 1140 FEET EAST FROM W1/4 CORNER, SECTION 7

A description of the place of use to which this right is appurtenant is as follows:

Twp	Rng	Mer	Sec	Q-Q
2 N	3 W	WM	18	NW SW
2 N	3 W	WM	18	SW SW
2 N	3 W	WM	19	NW NW
2 N	3 W	WM	19	SW NW
2 N	3 W	WM	19	NW SW
2 N	3 W	WM	19	SW SW
2 N	3 W	WM	29	SW SW
2 N	3 W	WM	30	NW NW
2 N	3 W	WM	30	SW NW
2 N	3 W	WM	30	NW SW
2 N	3 W	WM	30	SW SW

NOTICE OF RIGHT TO PETITION FOR RECONSIDERATION OR JUDICIAL REVIEW

This is an order in other than a contested case. This order is subject to judicial review under ORS 183.484. Any petition for judicial review must be filed within the 60-day time period specified by ORS 183.484(2). Pursuant to ORS 536.075 and OAR 137-004-0080, you may either petition for judicial review or petition the Director for reconsideration of this order. A petition for reconsideration may be granted or denied by the Director, and if no action is taken within 60 days following the date the petition was filed, the petition shall be deemed denied. In addition, under ORS 537.260 any person with an application, permit or water right certificate subsequent in priority may jointly or severally contest the issuance of the certificate at any time before it has issued, and after the time has expired for the completion of the appropriation under the permit, or within three months after issuance of the certificate.

Twp	Rng	Mer	Sec	Q-Q
2 N	3 W	WM	30	SE SW
2 N	3 W	WM	30	SW SE
2 N	3 W	WM	30	SE SE
2 N	3 W	WM	31	NE NE
2 N	3 W	WM	31	NW NE
2 N	3 W	WM	31	SE NE
2 N	3 W	WM	31	NE NW
2 N	3 W	WM	31	NW NW
2 N	3 W	WM	31	SW NW
2 N	3 W	WM	31	SE NW
2 N	3 W	WM	31	NE SW
2 N	3 W	WM	31	NW SW
2 N	3 W	WM	31	SW SW
2 N	3 W	WM	31	SE SW
2 N	3 W	WM	31	SW SE
2 N	3 W	WM	32	NW NW
2 N	3 W	WM	32	SW NW
2 N	4 W	WM	13	NE SE
2 N	4 W	WM	13	SE SE
2 N	4 W	WM	24	NE NE
2 N	4 W	WM	24	SE NE
2 N	4 W	WM	24	NE SE
2 N	4 W	WM	24	SE SE
2 N	4 W	WM	25	NE NE
2 N	4 W	WM	25	SE NE
2 N	4 W	WM	25	NE SE
2 N	4 W	WM	25	SW SE
2 N	4 W	WM	25	SE SE
2 N	4 W	WM	36	NE NE
2 N	4 W	WM	36	NW NE
2 N	4 W	WM	36	SE NE
2 N	4 W	WM	36	NE SE
2 N	4 W	WM	36	SE SE

The use of water allowed herein may be made only at times when sufficient water is available to satisfy all prior rights, including prior rights for maintaining instream flows.

THIS CERTIFICATE IS ISSUED TO CORRECTLY DESCRIBE THE POINTS OF DIVERSION, AND SUPERCEDES CERTIFICATE 82927.

WITNESS the signature of the Water Resources Director, affixed FEB 16 2007.

Phillip C. Ward, Director
Water Resources Department

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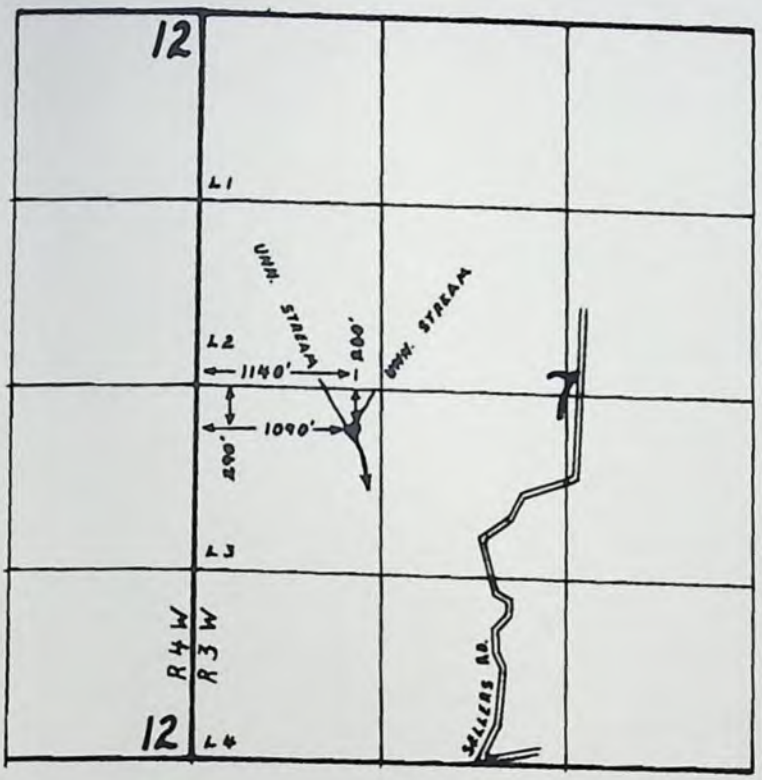
OCT 2 2017

SALEM, OR

 Recorded in State Record of Water Right Certificates numbered 83138.

T. 2 N., R. 3 & 4 W., W.M.



1" = 1320'

FINAL PROOF SURVEY

UNDER

Application No. 65611 Permit No. 48173
IN NAME OF

CITY OF BANKS

Surveyed JULY 14, 1993, by R.W. Klassen

41067 589 1041 RWK 12/93

STATE OF OREGON

COUNTY OF WASHINGTON

PERMIT TO APPROPRIATE THE PUBLIC WATERS

THIS PERMIT IS HEREBY ISSUED TO

CITY OF BANKS
100 S MAIN ST
BANKS, OR 97106

The specific limits and conditions of the use are listed below.

APPLICATION FILE NUMBER: G-15887

SOURCE OF WATER: A WELL (WASH 62373) IN WEST FORK DAIRY CREEK BASIN

PURPOSE OR USE: MUNICIPAL USE

MAXIMUM RATE: 1.0 CUBIC FOOT PER SECOND

PERIOD OF USE: YEAR ROUND

DATE OF PRIORITY: DECEMBER 5, 2002

WELL LOCATION (WELL 4 ON APPLICATION MAP):

NE ¼ NW ¼, SECTION 31, T2N, R3W, W.M.; 120 FEET SOUTH & 2070 FEET EAST FROM NW CORNER, SECTION 31

THE PLACE OF USE IS LOCATED AS FOLLOWS:

WITHIN THE SERVICE BOUNDARY OF THE CITY OF BANKS

Measurement, recording and reporting conditions:

A. Before water use may begin under this permit, the permittee shall install a totalizing flow meter or other suitable measuring device as approved by the Director at each point of appropriation. The permittee shall maintain the meter or measuring device in good working order, shall keep a complete record of the amount of water used each month, and shall submit an annual report which includes the recorded water use measurements to the Department by December 1 of each year. Further, the Director may require the permittee to report general water-use information, including the place and nature of use of water under the permit.

B. The permittee shall allow the watermaster access to the meter or measuring device; provided however, where the meter or measuring device is located within a private structure, the watermaster shall request access upon reasonable notice.

(1) Use of water from the well, as allowed herein, shall be controlled or shut off if the well displays:

(a) An average water level decline of three or more feet per year for five consecutive years; or

(b) A total water level decline of fifteen or more feet; or

(c) A hydraulic interference decline of fifteen or more feet in any neighboring well providing water for senior exempt uses or wells covered by prior rights.

(2) The permittee/appropriator shall be responsible for complying with each of the following requirements for measuring water levels in the well.

(a) Use of water from a new well shall not begin until an initial static water level in the well has been measured and reported to the Department.

(b) In addition to the measurement required in subsection (a) of this section, a water level measurement shall be made each year during the period March 1 through March 31.

(c) All water level measurements shall be made by a qualified individual. Qualified individuals are certified water rights examiners, registered geologists, registered professional engineers, licensed land surveyors, licensed water well constructor, licensed pump installer, or the permittee/appropriator.

(d) Any qualified individual measuring a well shall use standard methods of procedure and equipment designed for the purpose of well measurement. The equipment used shall be well suited to the conditions of construction at the well. A list of standard methods of procedure and suitable equipment shall be available from the Department.

(e) The permittee/appropriator shall report the record of measurement to the Department on a form available from the Department. The record of measurement shall include both measurements and calculations, shall include a certification as to their accuracy signed by the individual making the

measurements, and shall be submitted to the Department within 90 days from the date of measurement. The Department shall determine when any of the declines cited in section (1) are evidenced by the well measurement required in section (2).

STANDARD CONDITIONS

Failure to comply with any of the provisions of this permit may result in action including, but not limited to, restrictions on the use, civil penalties, or cancellation of the permit.

If the number, location, source, or construction of any well deviates from that proposed in the permit application or required by permit conditions, this permit may not be valid, unless the Department authorizes the change in writing.

If substantial interference with a senior water right occurs due to withdrawal of water from any well listed on this permit, then use of water from the well(s) shall be discontinued or reduced and/or the schedule of withdrawal shall be regulated until or unless the Department approves or implements an alternative administrative action to mitigate the interference. The Department encourages junior and senior appropriators to jointly develop plans to mitigate interferences.

The well(s) shall be constructed in accordance with the General Standards for the Construction and Maintenance of Water Wells in Oregon. The works shall be equipped with a usable access port, and may also include an air line and pressure gauge adequate to determine water level elevation in the well at all times.

Where two or more water users agree among themselves as to the manner of rotation in the use of water and such agreement is placed in writing and filed by such water users with the watermaster, and such rotation system does not infringe upon such prior rights of any water user not a party to such rotation plan, the watermaster shall distribute the water according to such agreement.

Prior to receiving a certificate of water right, the permit holder shall submit the results of a pump test meeting the department's standards, to the Water Resources Department. The Director may require water level or pump test results every ten years thereafter.

This permit is for the beneficial use of water without waste. The water user is advised that new regulations may require the use of best practical technologies or conservation practices to achieve this end.

By law, the land use associated with this water use must be in compliance with statewide land-use goals and any local acknowledged land-use plan.

The use of water shall be limited when it interferes with any prior surface or ground water rights.

This permit does not allow unauthorized inundation of property not under the ownership of the permit holder.

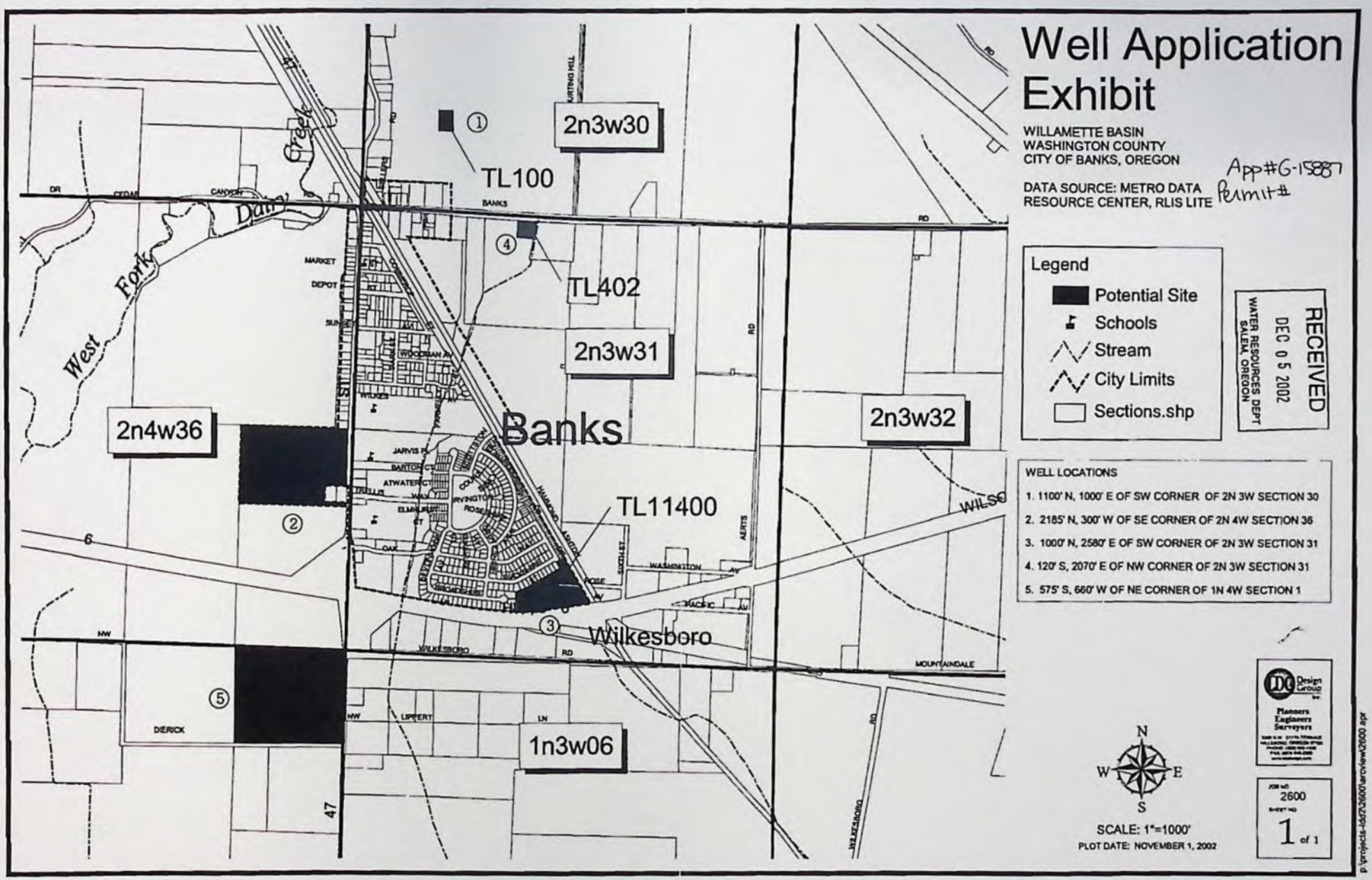
The permittee shall commence and complete the construction of any proposed works within 20 years from the date of permit issuance. The Department may order and allow an extension of time to complete construction or to perfect a water right beyond 20 years from the date of permit issuance.

Within one year after complete application of water to the proposed use, the permittee shall submit a claim of beneficial use, which includes a map and report, prepared by a Certified Water Rights Examiner (CWRE).

Issued APRIL 28, 2008

E. Timothy Wall

for Phillip C. Ward, Director
Water Resources Department



Oregon Water Resources Department
725 Summer Street NE, Suite A
Salem, Oregon 97301-1271
(503) 986-0900
www.wrd.state.or.us

Application for Water Right
Transfer

Please type or print legibly in dark ink. If your application is incomplete or inaccurate, we will return it to you. If any requested information does not apply to your application, insert "n/a". Please read and refer to the instructions when completing your application. A summary of review criteria and procedures that are generally applicable to these applications is available at www.wrd.state.or.us/publication/reports/index.shtml.

APPLICATION FOR:

Please check one

☐ Water Right Transfer	☐ Temporary Transfer	☐ Drought Transfer
☐ Historic Change in POD	(number of years ____)	☐ Point of Diversion Change
☐ To Instream Use	☑ Permit Amendment	Due to Government Action
☐ Other Transfer		

1. APPLICANT INFORMATION

Name: City of Banks
First Last

Address: _____

Banks OR 97106
City State Zip

Phone: 503-324-5112
Home Work Other

*Fax: 503-324-6674 *E-Mail address: _____

Optional information

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SALEM, OREGON

2. AGENT INFORMATION

(The agent listed is authorized to represent the applicant in all matters relating to this transfer application)

Name: Tom Michalek
First Last

Address: LDC Design Group, 20085 NW Tanasbourne Drive

Hillsboro OR 97124
City State Zip

Phone: 503-858-4242
Home Work Other

*Fax: 503-645-5500 *E-Mail address: michalekt@ldcdesign.com

Optional information

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FSD
SALEM, OR

T 10055

OWRD0019

3. TYPE OF CHANGE PROPOSED

Please check all that apply

Point of Diversion or Appropriation	Place of Use	Character of Use (n/a for Permit Amendments)
☐ Change (The old point of diversion or appropriation will **not** be used for the portion of the water right affected by the transfer.) ☑ Additional (Both the old and new points of diversion or appropriation will be used for the portion of the water right affected by the transfer.) ☐ Historic Point of Diversion (Unauthorized point of diversion used for more than 10 years.) ☐ Surface Water to Ground Water (A new point of appropriation will be used **instead of** the old point of diversion and not as an additional point of appropriation.)	☐ All, or a portion, of the right will be exercised at a different location than currently authorized. (Use of water at the current location will be discontinued.) ☐ Exchange (Water from another source will be used in exchange for supplying an equal amount of replacement water to that source.)	Proposed new use: ☐ Irrigation ☐ Municipal ☐ Quasi-municipal ☐ Commercial ☐ Industrial ☐ Instream (complete **Supplemental Form B**) ☐ Domestic (indicate number of households) _____ ☐ Other _____ ☐ Substitution (A supplemental ground water right will be substituted for a primary surface water right.)

Reason for changes: Add an additional well to the existing system to increase groundwater pumping capacity to meet the allowable permit maximum.

Describe the ***current*** water delivery system. Include information on the pumps, canals, pipelines and sprinklers used to divert, convey and apply the water at the authorized place of use.

The description must be sufficient to demonstrate that the full quantity of water to be transferred can be conveyed from the authorized source and applied at the authorized location and that the applicant is ready, willing, and able to exercise the right. (Not applicable to applications for Permit Amendments.)

n/a

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System capacity: _____ cubic feet per second (cfs)

*Attach one or more **Evidence of Use Affidavits** (Supplemental Form A) demonstrating that each of the right(s) involved in the transfer have been exercised in the last five years or that a presumption of forfeiture for non-use could be rebutted. (Not applicable to applications for Permit Amendments.)*

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SALEM, OREGON

4. CURRENT WATER RIGHT INFORMATION

*A separate page providing the information in this section must be completed for **each** certificate, permit, decree, or other right involved in the proposed transfer.*

Water Right Subject to Transfer (check and complete **one** of the following):

☐	Certificated Right	Certificate Number	Permit Number or Decree Name
☐	Adjudicated, Un-certificated Right	Name of Decree	Page Number
☐	Permit for which Proof has been Approved	Permit Number	Date Claim of Beneficial Use Submitted
☐	Transferred Right for which Proof has been Filed	Previous Transfer Number	Date Claim of Beneficial Use Submitted
☑	Permit for which an Amendment is Requested	G-7593 Permit Number	Completion Date of Permit

Name on Permit, Certificate, or Decree: City of Banks

County: Washington Authorized Use(s): Municipal

Are there multiple **Priority Dates** identified on the water right? ☐ Yes ☑ No

*If "Yes", any information provided on **Page 4 must** identify which priority date is associated with each of the proposed points of diversion/appropriation and places of use. In addition, list those priority dates:* September 29, 1977

Source(s) of Water Listed on Right: A Well

Tributary to: E. Fork Diary Creek basin

Are there other **Sources** listed on the water right? ☐ Yes ☑ No

*If "Yes", any information provided on **Page 4 must** identify which source is associated with each of the proposed points of diversion/appropriation and proposed places of use. In addition, list those other sources:*

Are there **Other Water Rights** or permits associated with this land? ☑ Yes ☐ No

If "Yes", what are the Permit or Certificate Numbers? Cert. 5353, S-48173

Pursuant to ORS 540.510, any right that is supplemental to a primary right proposed for transfer must be included in the transfer or be cancelled.

Remarks: The permits and certificate held by the City of Banks are for municipal use within the City's service area.

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SALEM, OREGON

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Certificate Number or other identifying number from *Page 3*: Permit G-7593

*A separate page providing the following information must be completed for **each** certificate, permit, decree, or other right involved in the proposed transfer.*

Is the entire water right identified on *Page 3* affected by this transfer? ☑ Yes ☐ No

*If "Yes", the remainder of **this page** need **not** be completed.*
*If "No", the following information **must be provided** only for those points of diversion/appropriation and places of use that are **involved in the transfer**.*

Government lot and donation land claim numbers must be included in the tables below only if the information is reflected on the existing water right.

Location of Existing Authorized Point(s) of Diversion or Appropriation to be Changed:

Township		Range		Mer	Sec	¼ ¼ Section	Gov't Lot or DLC	Survey Coordinates (coordinates from a recognized survey corner)
2	N	3	W		31	NE, NW		150 feet south and 1,990 feet east of northwest corner of section 31.

Location of Existing Authorized Place of Use to be Changed:

Township		Range		Mer	Sec	¼ ¼ Section	Gov't Lot or DLC	Acres (if applicable)

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T 10055

OWRD0022

Received October 20, 2006

5. PROPOSED CHANGES TO THE WATER RIGHT

*A separate page providing the information in this section must be completed for **each** certificate, permit, decree, or other right involved in the proposed transfer.*

Certificate Number or other identifying number from ***Section 4***: Permit G-7593

Location of Proposed Point(s) of Diversion or Point(s) of Appropriation:

Township		Range		Mer	Sec	¼ ¼ Section	Gov't Lot or DLC	Survey Coordinates (coordinates from a recognized survey corner)
2	N	3	W		31	NE,NW		100 feet south and 2,015 feet east of northwest corner of section 31

Attach additional copies as necessary to describe locations of other proposed points of diversion or appropriation. Clearly mark each of the additional copies with the appropriate Certificate Number or other identifying number. Not applicable to applications for transfers to instream water rights.

Location of Proposed Place of Use:

Township		Range		Mer	Sec	¼ ¼ Section	Gov't Lot or DLC	Acres (if applicable)

Attach additional copies as necessary to describe locations of other proposed places of use. Clearly mark each of the additional copies with the appropriate Certificate Number or other identifying number. Not applicable to applications for transfers to instream water rights.

Remarks: Place of use will not change and will remain within the City of Banks service area.

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SALEM, OREGON

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OWRD0023

6. AFFECTED DISTRICTS AND LOCAL GOVERNMENTS

Are any of the water rights proposed for transfer located within or served by an irrigation or other water district? ☑ Yes ☐ No

Will any of the water rights be located within or served by an irrigation or other water district after the proposed transfer? ☑ Yes ☐ No

Is water for any of the rights supplied under a water service agreement or other contract for stored water with a Federal agency? ☐ Yes ☑ No

*If "**Yes**", for any of the above, list the name and mailing address of the district and/or agency:*

City of Banks, 100 S. Main St., Banks, OR 97124

List the name and mailing address of all affected local governments (e.g., county, city, municipal corporation, and tribal governments within whose jurisdiction the rights are located).

City of Banks, 100 S. Main St., Banks, OR 97124

7. LAND OWNERSHIP

Does the applicant own the lands **FROM** which the right is being transferred? ☐ Yes ☐ No
If "No", provide the following information. For Temporary Transfers, also include a notarized statement granting consent to the transfer from each of the landowners:

Names of Current Landowner(s): N/A
First Last

Address: _____
City State Zip

Does the applicant own the lands **TO** which the right is being transferred? ☐ Yes ☐ No
If "No", provide the following information:

Names of Receiving Landowner(s): N/A
First Last

Address: _____
City State Zip

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Check one of the following:

☐ The receiving landowner will be responsible for completion of the proposed changes after the final order is issued. All notices and correspondence should be sent to this landowner.

☐ The applicant will remain responsible for completion of changes. Notices and correspondence should continue to be sent to the applicant and applicant's agent.

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8. ATTACHMENTS

Check each of the following attachments included with this application. The application will be returned if all required attachments are not included.

Form A – Evidence of Use Affidavits

☑ At least one Evidence of Use Affidavit documenting that the right has been used during the last five years or that the right is not subject to forfeiture under ORS 540.610 is attached. The affidavit provided must be the original, not a copy.

Form B – Instream Water Right Transfer

☐ Required for instream transfers only.

Map

☐ Permanent Water Right Transfer
The map must be prepared by a Certified Water Right Examiner and meet the requirements of OAR 690-380-3100 unless a waiver has been granted. The map provided must be the original, not a copy.

☑ Permit Amendment, Temporary Transfer, or Other Application
A map meeting the requirements of OAR 690-380-3100 must be included but need not be prepared by a Certified Water Right Examiner.

Evidence of Lien Holder Notification

☐ Copies of the written notification of the proposed transfer provided by the applicant to each lien holder, unless the water right has been quit claimed.

Recorded Deed

☐ Required for temporary transfers only.

Land Use Information Form:

☑ Enclosed

☐ Not Required if all of the following are met:
1. In EFU zone or irrigation district,
2. Change in place of use only,
3. No structural changes needed, including diversion works, delivery facilities, other structures, and
4. Irrigation only.

Water Well Reports/Well Logs:

☑ The application is for a change in point of appropriation or change from surface water to ground water and copies of all water well reports are attached.

☐ Water well reports are not available and a description of construction details including well depth, static water level, and information necessary to establish the ground water body developed or proposed to be developed is attached.

☐ The application is for a surface water transfer and water well reports are not required.

Fees:

☑ Amount enclosed: $ 350.00
See the Department's Fee Schedule at www.wrd.state.or.us or call (503) 986-0900.

9. SIGNATURES

I (we) understand that prior to approval of a permanent transfer and after issuance of a draft preliminary determination by the Department, I (we) must submit:

(1) A report on ownership and lien information prepared by a title company within the last three months if required under OAR 690-380-3000(18), and

(2) If I (we) are not the landowners, proof that the landowner or entity to which the water right has been quitclaimed consents to the transfer or that ownership information is not required.

I (we) affirm that the information contained in this application is true and accurate.

applicant signature	name (print)	date
Michael Lyda	Michael Lyda	12/20/05

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Before submitting your application, be sure you have:

- Answered each question completely.
- Included the required attachments.
- Provided original signatures for all named deed holders or other parties with an interest in the right.
- Included a check payable to the Oregon Water Resources Department for the appropriate amount.

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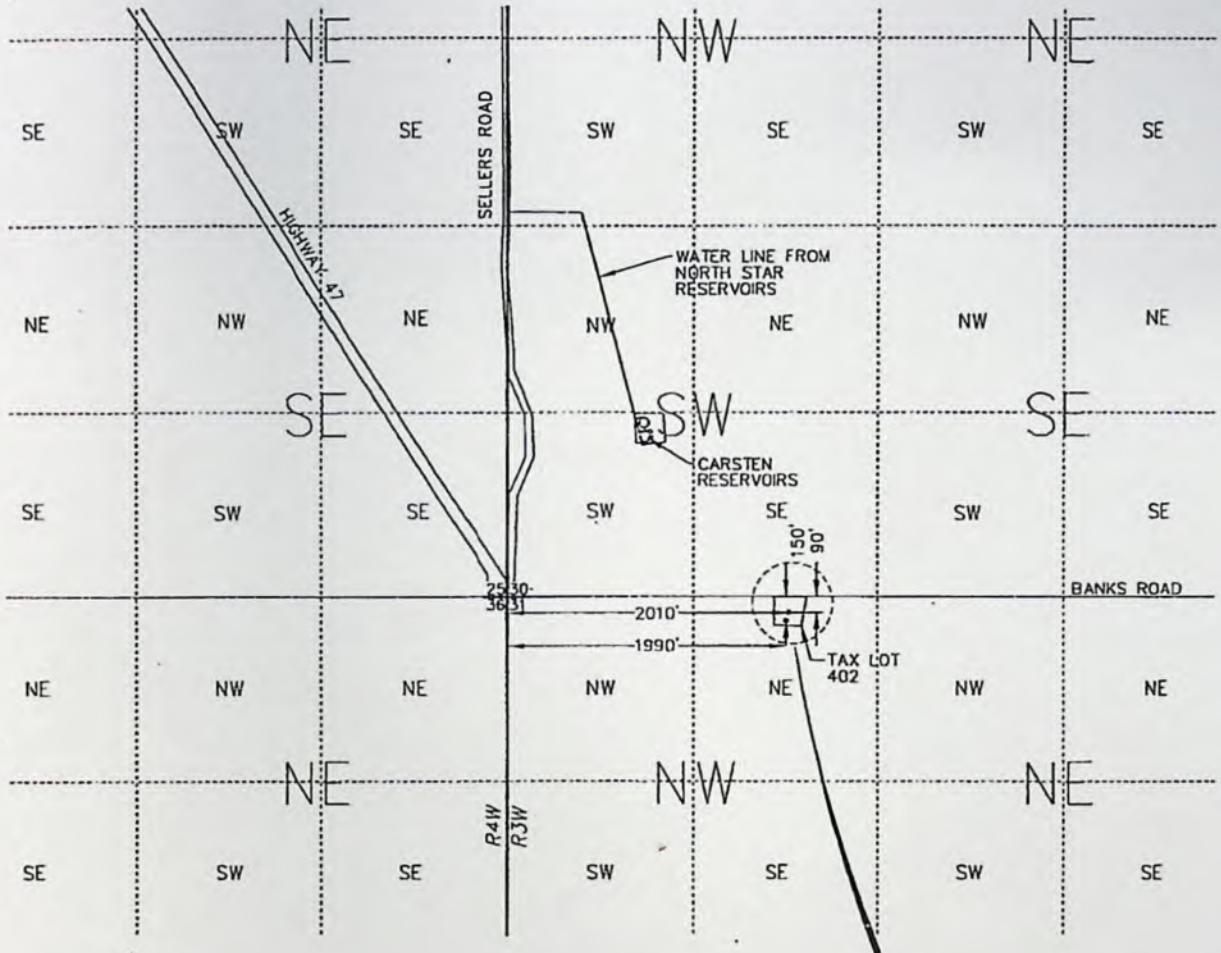
SALEM, OREGON

T 10055

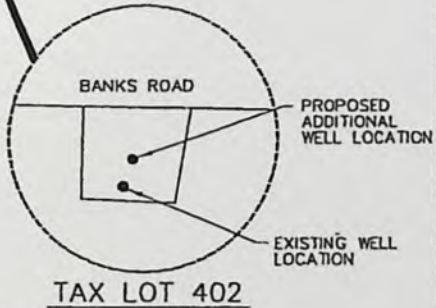
SECTION 31 T2N R3W W.M.



NORTH

0 1320

1 inch = 1320 ft.



TAX LOT 402

1" = 400'

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SALEM, OREGON

EXISTING POINT OF APPROPRIATION: A WELL, LOCATED 150' SOUTH AND 1990' EAST OF THE NORTHWEST CORNER OF SECTION 31.

PROPOSED POINT OF APPROPRIATION: 90' SOUTH AND 2010' EAST OF THE NORTHWEST CORNER OF SECTION 31.

PLACE OF USE: WITHIN THE SERVICE BOUNDARIES OF THE CITY OF BANKS.

THE PREPARATION OF THIS MAP WAS FOR THE PURPOSE OF IDENTIFYING THE LOCATION OF THE WATER RIGHTS AND HAS NO INTENT TO PROVIDE DIMENSIONS OR LOCATIONS OF PROPERTY OWNERSHIP LINES.

PREPARED FOR:
CITY OF BANKS
100 SOUTH MAIN STREET
BANKS, OREGON 97106
503-324-5112
T 10055

LDC Planners Engineers Surveyors
DESIGN GROUP
70085 N.W. TANASBOURNE DR.
HILLSBORO, OREGON 97124
PHONE: (503) 858-4242
FAX: (503) 645-5500
www.ldcdesign.com

DRAWING TITLE:
PERMIT AMENDMENT MAP
APPL. G--8476
PERMIT G-7593
CITY OF BANKS

KWH

JOB NO.: 0036

DRAWING NO.: 1 of 1

HanK, Plotted: Sep 19, 2005 - 9:50am, P:\0_Archive\p\dwg\Water Rights\3061PAM.dwg

OWRD0026

Exhibit B: Permit G-7593 (Application G-8476) and Application Map

Application No. G-8476 Permit No. G 7593

STATE OF OREGON WATER RESOURCES DEPARTMENT

Application for a Permit to Appropriate Ground Water

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I, City of Banks, Oregon (Name of Applicant)

of City Hall (Mailing Address), Banks (City),

State of Oregon, 97106 (Zip Code) Phone No. Mayor Howard Steinbach 324-2251 do hereby
Robert Prickett, City Recorder 324-8462

make application for a permit to appropriate the following described ground waters of the State of Oregon:

1. The development will consist of one well (Give number of wells, tile lines, infiltration galleries, etc.)

having a diameter of 8 inches and an estimated depth of 450 feet.

2. The well or other source is to be located 135 ft. S (N. or S.) and 560 ft. W (E. or W.)

from the ¼ corner of X on the north line of Section 31, T2N, R3W, W.M. (Public Land Survey Corner)

(If there is more than one well, each must be described)

being within the NE ¼ of the NW ¼ of

Sec. 31 Tp. 2N R. 3W, W. M., in the county of Washington

3. Location of area to be irrigated, or place of use if use other than irrigation.

Township	Range	Section	List ¼ ¼ of Section	List use and/or number of acres to be irrigated
SEE ATTACHED	SHEET #1			

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4. It is estimated that 210 feet of the well will require 8 5/8" diameter welded steel (Kind) casing.

5. Depth to water table is estimated (Feet) Well drilled by A.M. Jannsen Drilling Co.
Aloha, Oregon

Form 690-3-0-1-77

6. *The amount of water which the applicant intends to apply to beneficial use is ..... cubic feet per second or* ....300..... *gallons per minute.*

7. *The use to which the water is to be applied is* municipal.

8. *If the flow to be utilized is artesian, the works to be used for the control and conservation of the supply when not in use must be described.*

(not artesian)

9. *If the location of the well, or other development work is less than one-fourth mile from a natural stream channel, give the distance to the channel and the difference in elevation between the stream bed and the ground surface at the source of development.*

Natural stream channel (intermittent flow) 130 feet due east of well. Well is 10 feet higher than streambed.

10. *DESCRIPTION OF WORKS*

Include length and dimensions of supply ditch or pipeline, size and type of pump and motor, type of irrigation system to adequately describe the proposed distribution system.

Water will be conveyed from well to existing city reservoir (as shown on attached map) through an 8-inch pipeline.

The proposed well pump will be a 40 H.P., 14 stage deep well turbine capable of delivering 300 gallons per minute to a 400 ft. T.D.H.

11. *Construction work will begin on or before* Well construction - August 16, 1977
Pump & pipeline - January, 1978

12. *Construction work will be completed on or before* Well construction - August 24, 1977
Pump & pipeline - June, 1978

13. *The water will be completely applied to the proposed use on or before* July, 1978

14. *If the ground water supply is supplemental to an existing supply, identify the supply and existing water right.* See attached map showing existing water supply system. Water right certificate no. 5353.

Application No. G-8476 *Permit No.* G 7593

SHEET #1

3. Location of area to be irrigated, or place of use if use other than irrigation.

Township	Range	Section	List ¼ ¼ of Section
T2N	R3W	29	SW¼ SW¼
T2N	R3W	30	NW¼ SW¼
			SW¼ SW¼
			SE¼ SW¼
			SW¼ SE¼
			SE¼ SE¼
T2N	R3W	31	NW¼ NW¼
			NE¼ NW¼
			NW¼ NE¼
			NE¼ NE¼
			SE¼ NE¼
			SE¼ NW¼
			SW¼ NW¼
			NW¼ SW¼
			SW¼ SW¼
T2N	R3W	32	NW¼ NW¼
			SW¼ NW¼
T2N	R4W	25	NE¼ SE¼
			SE¼ SE¼
			SW¼ SE¼
T2N	R4W	36	NW¼ NE¼
			NE¼ NE¼
			SE¼ NE¼
			NE¼ SE¼
			SE¼ SE¼

Application No. G-8176
Permit No. G 7593

SHEET #2

REMARKS:

The City of Banks presently obtains it's water supply from springs about 4 miles north of the City (see Water Right Certificate No. 5353 and attached map). The present supply is not sufficient to meet summer-time needs; therefore a new well was constructed. At present, Banks supplys water to 747 persons and in year 2000 it is estimated that 1,971 persons will be served. Average day water requirements are presently 104,500 G.P.D. and in year 2000 it is estimated to be 276,000 G.P.D.

Requirements of the average day of the maximum month are presently 200,000 G.P.D. and in year 2000 it is estimated to be 524,000 G.P.D. The present supply (springs) can provide 173,000 G.P.D. and the proposed well can supply 432,000 G.P.D. for a total of 605,000 G.P.D. which will meet the estimated needs in year 2000.

Application No. G-8476
Permit No.

Remarks: SEE ATTACHED SHEET #2

Howard D. Steinbach Mayor
Signature of Applicant
City of Banks, Banks, Or.

This is to certify that I have examined the foregoing application, together with the accompanying maps and data, and return the same for

In order to retain its priority, this application must be returned to the Water Resources Director with corrections on or before , 19

WITNESS my hand this day of , 19

Water Resources Director

By

This instrument was first received in the office of the Water Resources Director at Salem, Oregon, on the 29TH *day of* SEPTEMBER, 19 77, *at* 8:00 *o'clock* A *M.*

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SALEM, OR

Application No. G-8476 *Permit No.* G 7593

Application No. G-8476 Permit No. G 7593

Permit to Appropriate the Public Waters of the State of Oregon

This is to certify that I have examined the foregoing application and do hereby grant the same, SUBJECT TO EXISTING RIGHTS INCLUDING THE EXISTING MINIMUM FLOW POLICIES ESTABLISHED BY THE WATER POLICY REVIEW BOARD and the following limitations and conditions:

The right herein granted is limited to the amount of water which can be applied to beneficial use and shall not exceed 0.67 *cubic feet per second measured at the point of diversion from the well or source of appropriation, or its equivalent in case of rotation with other water users, from* a well

The use to which this water is to be applied is municipal.

If for irrigation, this appropriation shall be limited to ..... of one cubic foot per second or its equivalent for each acre irrigated and shall be further limited to a diversion of not to exceed ..... acre feet per acre for each acre irrigated during the irrigation season of each year;

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and shall be subject to such reasonable rotation system as may be ordered by the proper state officer.

The well shall be constructed in accordance with the General Standards for the Construction and Maintenance of Water Wells in Oregon.

(1) *The works constructed shall include an air line and pressure gauge or an access port for measuring line, adequate to determine water level elevation in the well at all times.*

(2) *The permittee shall install and maintain a weir, meter, or other suitable measuring device, and shall keep a complete record of the amount of ground water withdrawn.*

The priority date of this permit is September 29, 1977

Actual construction work shall begin on or before December 2, 1978 *and shall thereafter be prosecuted with reasonable diligence and be completed on or before October 1, 19*79

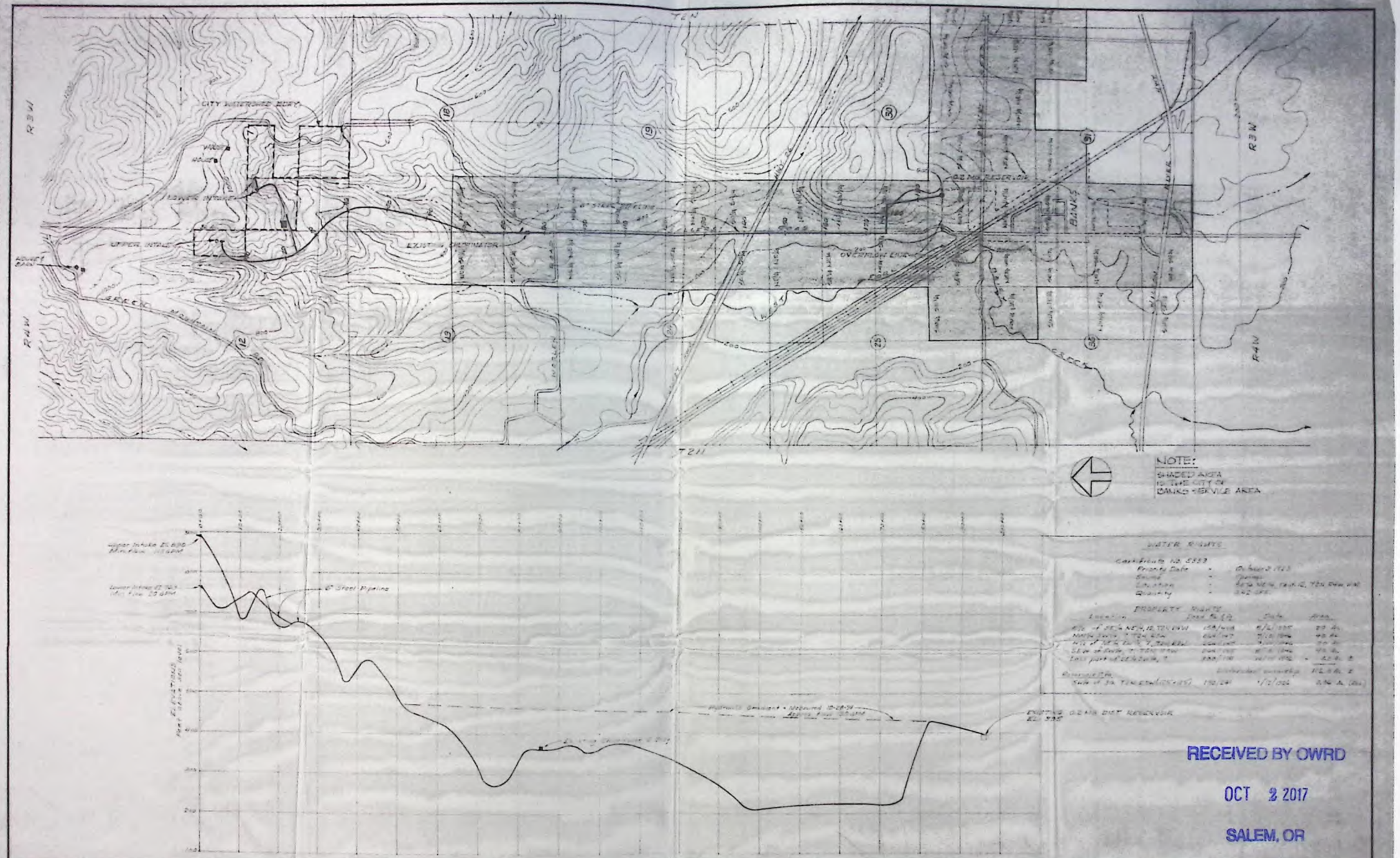
*Complete application of the water to the proposed use shall be made on or before October 1, 19*80

WITNESS my hand this 2nd *day of* December, *19*77

James E. Sexton

Water Resources Director

Application No. G 8116
Permit No. G 7593



Oregon Water Resources Department
Water Rights Division

Water Rights Application
Number G-8476

Final Order
Extension of Time for Permit Number G-7593

Appeal Rights

This is a final order in other than contested case. This order is subject to judicial review under ORS 183.484. Any petition for judicial review must be filed within the 60 day time period specified by ORS 183.484(2). Pursuant to ORS 536.075 and OAR 137-004-0080 you may either petition for judicial review or petition the Director for reconsideration of this order. A petition for reconsideration may be granted or denied by the Director, and if no action is taken within 60 days following the date the petition was filed, the petition shall be deemed denied.

Application History

The Department issued Permit G-7593 on December 2, 1977. The permit called for completion of construction by October 1, 1979, and complete application of water to beneficial use by October 1, 1980. On May 17, 2007, the City of Banks submitted an application to the Department for an extension of time for Permit G-7593. In accordance with OAR 690-315-0050(2), on September 11, 2007, the Department issued a Proposed Final Order proposing to extend the time to complete construction to October 1, 2017 and to extend the time to fully apply water to beneficial use to October 1, 2017. The protest period closed October 26, 2007, in accordance with OAR 690-315-0060(1). No protest was filed.

At time of issuance of the Proposed Final Order the Department concluded that, based on the factors demonstrated by the applicant, the permit may be extended subject to the following conditions:

CONDITIONS

(3) 1. **Development Limitations**

Diversion of any water beyond 0.613 cfs under Permit G-7593 shall only be authorized upon issuance of a final order approving a Water Management and Conservation Plan (WMCP) under OAR Chapter 690, Division 86. The required WMCP shall be submitted to the Department within 3 years of an approved extension application. Use of water under Permit G-7593 must be consistent with this and subsequent WMCP's approved under OAR Chapter 690, Division 86 on file with the Department.

The deadline established in this PFO for submittal of a WMCP shall not relieve a permit holder of any existing or future requirement for submittal of a WMCP at an earlier date as

established through other orders of the Department. A WMCP submitted to meet the requirements of this order may also meet the WMCP submittal requirements of other Department orders.

The applicant has demonstrated good cause for the permit extension pursuant to ORS 537.630, 539.010(5) and OAR 690-315-0080(3).

Order

The extension of time for Application G-8476, Permit G-7593, therefore, is approved subject to conditions contained herein. The deadline for completing construction is extended to October 1, 2017. The deadline for applying water to full beneficial use is extended to October 1, 2017.

DATED: November 20, 2008

Dwight French, Administrator of
Water Rights and Adjudications
for
Phillip C. Ward, Director

If you have any questions about statements contained in this document, please contact Ann L. Reece at (503) 986-0827.

If you have other questions about the Department or any of its programs, please contact our Water Resources Customer Service Group at (503) 986-0900.

Exhibit C: Well Log WASH 7651

NOTICE TO WATER WELL CONTRACTOR
The original and first copy of this report are to be filed with the WATER RESOURCES DEPARTMENT, SALEM, OREGON 97310 within 30 days from the date of well completion.

WATER WELL REPORT
STATE OF OREGON
(Please type or print)

RECEIVED
SEP - 61977
(Do not write above this line)

WASH 4651

State Well No. 2N/3W-31
State Permit No.

(1) OWNER:
WATER RESOURCES DEPT.
SALEM, OREGON
Name City of Banks
Address Banks, Oregon

(2) TYPE OF WORK (check):
New Well ☒ Deepening ☐ Reconditioning ☐ Abandon ☐
If abandonment, describe material and procedure in Item 12.

(3) TYPE OF WELL:
Rotary ☒ Driven ☐
Cable ☐ Jetted ☐
Dug ☐ Bored ☐

(4) PROPOSED USE (check):
Domestic ☐ Industrial ☐ Municipal ☒
Irrigation ☐ Test Well ☐ Other ☐

(5) CASING INSTALLED:
Threaded ☐ Welded ☒
8-5/8" Diam. from plus 2 ft. to 210 ft. Gage .250
" Diam. from ft. to ft. Gage
" Diam. from ft. to ft. Gage

(6) PERFORATIONS:
Perforated? ☐ Yes ☒ No
Type of perforator used
Size of perforations in. by in.
perforations from ft. to ft.
perforations from ft. to ft.
perforations from ft. to ft.

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(7) SCREENS:
Well screen installed? ☐ Yes ☒ No
Manufacturer's Name
Type Model No.
Diam. Slot size Set from ft. to ft.
Diam. Slot size Set from ft. to ft.

(8) WELL TESTS:
Drawdown is amount water level is lowered below static level
Was a pump test made? ☒ Yes ☐ No If yes, by whom? AMJannsen
Yield: 275 gal./min. with 224 ft. drawdown after 48 hrs.
150 " 146 " "
" " " "
Bailer test gal./min. with ft. drawdown after hrs.
Artesian flow g.p.m.
Temperature of water 58° Depth artesian flow encountered ft.

(9) CONSTRUCTION:
Well seal—Material used Cement grout & 2% gel
Well sealed from land surface to 210 ft.
Diameter of well bore to bottom of seal 12-1/4" in.
Diameter of well bore below seal 8" in.
Number of sacks of cement used in well seal 25 sacks
How was cement grout placed? Placed on o.d. of casing & through grout pipe - 20 sacks run @ 210', 5 sacks run to top off at ground level upon completion
Was a drive shoe used? ☐ Yes ☒ No Plugs Size: location ft.
Did any strata contain unusable water? ☒ Yes ☐ No
Type of water? insufficient depth of strata 130' to 160'
Method of sealing strata off cased and cemented
Was well gravel packed? ☐ Yes ☒ No Size of gravel:
Gravel placed from ft. to ft.

(10) LOCATION OF WELL:
County Washington Driller's well number
¼ ¼ Section 31 T. 2 N R. 3 W. W.M.
Bearing and distance from section or subdivision corner

(11) WATER LEVEL: Completed well.
Depth at which water was first found 130 ft.
Static level 84 ft. below land surface. Date 8/24/77
Artesian pressure lbs. per square inch. Date

(12) WELL LOG:
Diameter of well below casing 8"
Depth drilled 450 ft. Depth of completed well 450 ft.

Formation: Describe color, texture, grain size and structure of materials; and show thickness and nature of each stratum and aquifer penetrated, with at least one entry for each change of formation. Report each change in position of Static Water Level and indicate principal water-bearing strata.

MATERIAL	From	To	SWL
Dark brown clay topsoil	0	8	
Silty brown clay	8	15	
Red-brown clay w/rotten rock fragments	15	50	
Sticky red clay-occ. rotten rock streaks	50	95	
Brown clay & rotten rock	95	110	
Dark brown & gray-brown clay --organic material	110	120	
Soft blue-gray cemented gravel	120	130	
Rotten brown basalt	130	160	20 gpm
Soft brown basalt-occ.weathered	160	195	
Black-brown basalt	195	215	
Hard gray-black basalt	215	230	
Broken brown basalt w/soapstone and lava interbeds	230	245	10 gpm
Fractured black basalt--occ. crevice	245	265	
Hard gray-black basalt, occ-			

Work started 8/16/77 19 Completed 8/24/77 19
Date well drilling machine moved off of well 8/24/77 19

Drilling Machine Operator's Certification:
This well was constructed under my direct supervision. Materials used and information reported above are true to my best knowledge and belief.
[Signed] (Drilling Machine Operator) Date 8/29/77, 19
Drilling Machine Operator's License No. 523

Water Well Contractor's Certification:
This well was drilled under my jurisdiction and this report is true to the best of my knowledge and belief.
Name A. M. Jannsen Drilling Co. (Person, firm or corporation) (Type or print)
Address 21075 SW Tualatin Valley Hwy. Aloha, Oregon
[Signed] Edward M Jannsen (Water Well Contractor)
Contractor's License No. 79 Date 8/29/77, 19

(USE ADDITIONAL SHEETS IF NECESSARY)

SP*45656-119

NOTICE TO WATER WELL CONTRACTOR
The original and first copy of this report are to be filed with the WATER RESOURCES DEPARTMENT, SALEM, OREGON 97310 within 30 days from the date of well completion.

RECEIVED
SEP - 6 1977
WATER RESOURCES DEPT.
SALEM, OREGON

WATER WELL REPORT
STATE OF OREGON
(Please type or print)
(Do not write above this line)

State Well No. 2N/3W-31

State Permit No.

(1) OWNER:
Name City of Banks Page 2

Address

(2) TYPE OF WORK (check):
New Well ☐ Deepening ☐ Reconditioning ☐ Abandon ☐

If abandonment, describe material and procedure in Item 12.

(3) TYPE OF WELL:
Rotary ☐ Driven ☐
Cable ☐ Jetted ☐
Dug ☐ Bored ☐

(4) PROPOSED USE (check):
Domestic ☐ Industrial ☐ Municipal ☐
Irrigation ☐ Test Well ☐ Other ☐

(5) CASING INSTALLED:
Threaded ☐ Welded ☐

_____" Diam. from _____ ft. to _____ ft. Gage _____

_____" Diam. from _____ ft. to _____ ft. Gage _____

_____" Diam. from _____ ft. to _____ ft. Gage _____

(6) PERFORATIONS:
Perforated? ☐ Yes ☐ No.

Type of perforator used

Size of perforations _____ in. by _____ in.

_____ perforations from _____ ft. to _____ ft.

_____ perforations from _____ ft. to _____ ft.

_____ perforations from _____ ft. to _____ ft.

(7) SCREENS:
Well screen installed? ☐ Yes ☐ No

Manufacturer's Name

Type _____ Model No. _____

Diam. _____ Slot size _____ Set from _____ ft. to _____ ft.

Diam. _____ Slot size _____ Set from _____ ft. to _____ ft.

(8) WELL TESTS:
Drawdown is amount water level is lowered below static level

Was a pump test made? ☐ Yes ☐ No If yes, by whom?

Yield: _____ gal./min. with _____ ft. drawdown after _____ hrs.

" " " "

" " " "

Bailer test _____ gal./min. with _____ ft. drawdown after _____ hrs.

Artesian flow _____ g.p.m.

Temperature of water _____ Depth artesian flow encountered _____ ft.

(9) CONSTRUCTION:
Well seal—Material used

Well sealed from land surface to _____ ft.

Diameter of well bore to bottom of seal _____ in.

Diameter of well bore below seal _____ in.

Number of sacks of cement used in well seal _____ sacks

How was cement grout placed?

Was a drive shoe used? ☐ Yes ☐ No Plugs _____ Size: location _____ ft.

Did any strata contain unusable water? ☐ Yes ☐ No

Type of water? _____ depth of strata _____

Method of sealing strata off

Was well gravel packed? ☐ Yes ☐ No Size of gravel: _____

Gravel placed from _____ ft. to _____ ft.

(10) LOCATION OF WELL:
County _____ Driller's well number _____

¼ ¼ Section _____ T. _____ R. _____ W.M.

Bearing and distance from section or subdivision corner

(11) WATER LEVEL: Completed well.
Depth at which water was first found _____ ft.

Static level _____ ft. below land surface. Date _____

Artesian pressure _____ lbs. per square inch. Date _____

(12) WELL LOG:
Diameter of well below casing _____

Depth drilled _____ ft. Depth of completed well _____ ft.

Formation: Describe color, texture, grain size and structure of materials; and show thickness and nature of each stratum and aquifer penetrated, with at least one entry for each change of formation. Report each change in position of Static Water Level and indicate principal water-bearing strata.

MATERIAL	From	To	SWL
fracture	265	315	5 gpm
Brown basalt-occ.broken	315	325	10 gpm
Hard black & gray-black basalt-occ. crevice	325	360	
Black basalt--occ. broken w/ green soapstone	360	380	25 gpm
Broken black & brown basalt-w/ lava & soapstone interbed	380	400	200 gpm
Broken gray-brown basalt w/ lava streaks	400	415	100gpm
Hard gray-black basalt--occ. crevice	415	450	

RECEIVED BY OWRD
OCT 2 2017
SALEM, OR

Work started 19 Completed 19

Date well drilling machine moved off of well 19

Drilling Machine Operator's Certification:
This well was constructed under my direct supervision. Materials used and information reported above are true to my best knowledge and belief.

[Signed] _____ (Drilling Machine Operator) Date _____, 19____

Drilling Machine Operator's License No. _____

Water Well Contractor's Certification:
This well was drilled under my jurisdiction and this report is true to the best of my knowledge and belief.

Name _____ (Person, firm or corporation) (Type or print)

Address _____

[Signed] _____ (Water Well Contractor)

Contractor's License No. _____ Date _____, 19____

(USE ADDITIONAL SHEETS IF NECESSARY)

SP+45656-119

Exhibit D: City of Banks Water Management and Conservation Plan

(62 pages)

City of Banks Water Management and Conservation Plan

Adopted by City Council October 12, 2010

Golder Associates

Golder Associates

September 8, 2010 Our Ref.: 073-99792

Kennedy/Jenks Consultants
200 S.W. Market Street, Suite 500
Portland, Oregon 97201

Attention: Gordon A. Munro, P.E

RE: CITY OF BANKS - WATER MANAGEMENT AND CONSERVATION PLAN AND ADENDA

Dear Gordon

This deliverable contains the final City of Banks Water Conservation and Management Plan (WMCP) and associated addenda. The WMCP was submitted to Oregon Water Resources Department (OWRD) for review in April of 2009. Lisa Jaramillo of OWRD responded to the April submittal with a request for clarifications and additional information. The letter response to Lisa Jaramillo is contained here as Addendum 1, dated June 23, 2010. An additional response to OWRD that further clarifies the need for green light water is included as Addendum 2.

Sincerely,

GOLDER ASSOCIATES INC.

Robert E. Long Jr. RG., CWRE
Associate, Senior Consultant

REL/REL

Attachments: City of Banks Water Management and Conservation Plan, April 7, 2009
WMCP Letter to Lisa Jaramillo (Addendum 1), June 23, 2010
Email to Lisa Jaramillo of OWRD (Addendum 2), July 15, 2010

cc: Jim Hough, City Administrator, City of Banks

Golder Associates Inc.
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Golder Associates: Operations in Africa, Asia, Australasia, Europe, North America and South America

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CITY OF BANKS
WATER MANAGEMENT AND CONSERVATION PLAN

Prepared for:
City of Banks
120 S Main Street
Banks, Oregon 97106

Submitted to:
Oregon Water Resources Department
North Mall Office Building
725 Summer Street NE, Suite A
Salem, Oregon 97301

Submitted by:
Golder Associates Inc.
9 SW Monroe Parkway, Suite 270
Portland, Oregon 97035
and
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200 SW Market Street, Suite 500
Portland, OR 97201

Robert Long, Jr., RG, CWRE
Associate Hydrogeologist

Kara Warner
Environmental Scientist

Distribution:
1 Copy - Oregon Water Resources Department
1 Copy- City of Banks
1 Copy - Kennedy/Jenks Consultants
1 Copy - Golder Associates Inc.

April 7, 2009

073-99792

EXECUTIVE SUMMARY

The City of Banks (City) is located approximately 26 miles west of Portland in the eastern foothills of the Coast Range of Oregon. The Water Department of Banks Public Works currently provides water to approximately 1740 residential, commercial, industrial, and irrigation customers in and around the city limits. This Water Management and Conservation Plan provides guidance to City officials to meet the current and future needs of the community, and demonstrates compliance with the requirements set forth in Oregon Administrative Rule Chapter 690 Division 86.

The City obtains water through diversion and treatment of surface water from Green Mountain Springs, located north of Banks, and well appropriation of groundwater from the Columbia River Basalt aquifer. The City of Banks holds two certificated surface water rights providing for water diverted from the Green Mountain Springs, and two permitted groundwater rights providing for appropriation from two wells within the city. The City's water supply system does not benefit from interties with other water providers, and City water sources do not contain listed species, are not water-quality limited, and do not occur in a critical groundwater area.

The City of Banks endeavors to conserve water resources by identifying and repairing leaking or aging infrastructure, implementing public education programs on conservation measures, and providing financial incentives to its customers to repair leaks in a timely manner. The City's Water-Use Curtailment Plan defines the system triggers and conservation actions in the event of a water shortage emergency and dictates the manner in which water-use curtailment is communicated, implemented, and enforced.

Water demand over the years 2005-2007 was fairly consistent and averaged approximately 152 gallons per capita per day. The City of Banks currently has the supply and storage capacities needed to service its existing customers; however, population growth and associated water usage forecasts suggest the City will need to increase its water supply in order to keep up with rising demand. The Banks city planner estimates that full build-out to the urban growth boundary will occur by 2024, at which time the total population of the City is estimated to be 3739. Future anticipated average day demand is significantly in excess of current available supply. The City will need to minimize water loss from the system, encourage water conservation by customers, and develop additional sources of supply in the coming years. Development of this Water Management and Conservation Plan is one of the ways in which the City of Banks is planning for safe sustainable water supply.

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ACRONYMS AND ABREVIATIONS

AWWA	American Water Works Association
cfs	cubic feet per second
CRB	Columbia River Basalt (aquifer)
Division 86	Oregon Administrative Rules, Chapter 690, Division 86
GIS	geographic information system
gpcpd	gallons per capita per day
gpm	gallons per minute
ISO	Insurance Services Office
KJC	Kennedy/Jenks Consultants, Engineers to the City of Banks
MG	million gallons
mgd	million gallons per day
MOU	Memorandum of Understanding
OAR	Oregon Administrative Rules
ODEQ	Oregon Department of Environmental Quality
ORS	Oregon Revised Statutes
OWRD	Oregon Water Resources Department
POA	point of appropriation (groundwater)
POD	point of diversion (surface water)
SSFP	slow sand filtration plant
TVID	Tualatin Valley Irrigation District
UGB	urban growth boundary
WMCP	Water Management and Conservation Plan

1.0 INTRODUCTION

1.1 Brief Water System Overview

The City of Banks (City), located approximately 26 miles west of Portland in the eastern foothills of the Coast Range, currently provides water to approximately 1740 residents within and outside the city limits. The City obtains water through diversion and treatment of surface water from Green Mountain Springs located north of the city, and appropriation of groundwater from the Columbia River Basalt (CRB) aquifer underlying the city.

The City's water supply system is self-contained and does not benefit from interties with other water providers, which are prohibitively expensive given the City's remote location more than six miles from the nearest neighboring municipality. The City does not appropriate water from sources that affect other local governments.

1.2 Plan Purpose and Sources of Information

Development of this Water Management and Conservation Plan (WMCP or Plan) is one of the ways in which the City of Banks is planning for future growth as additional land is brought within the City's urban growth boundary (UGB). The Plan is intended to provide guidance for management and conservation of existing water supplies as they are developed to meet the current and future needs of the community.

The City's updated Water Master Plan (Kennedy/Jenks, 2009), land use and other planning documents, water ordinances, and the institutional knowledge of city employees, were referenced during the preparation of this WMCP.

1.3 Compliance with Permit Extension Conditions

This Water Management and Conservation Plan is submitted to the Oregon Water Resources Department (OWRD) in partial fulfillment of the conditions set forth in the recent Extension of Permit G-7593, dated November 20, 2008.

1.4 Plan Implementation and Update Schedule

This is the first WMCP the City has submitted for OWRD approval. The City plans to submit a WMCP update in 2018 in compliance with the 10-year schedule required by Division 86 rules. A progress report detailing implementation of this plan will be submitted within 5 years, by 2014.

1.5 Plan Organization

This Water Management and Conservation Plan demonstrates compliance with the requirements set forth in Oregon Administrative Rule Chapter 690 Division 86 (Division 86 rules). Table 1-1 provides a summary of the components required by the Division 86 rules, and the sections of this Plan that address each requirement.

Table 1-1:
Summary of Required WMCP Content and Section(s) in which Requirements are Addressed

Sections and Tasks	OAR Reference	Report Section
Water Supplier Description (Section 2)		
Description of supplier's source(s)	690-086-0140 (1)	2.4
Delineation of current service area	690-086-0140 (2)	2.1
Assessment of adequacy and reliability of existing supplies	690-086-0140 (3)	2.6
Quantification of present and historic use	690-086-0140 (4)	2.3
Summary of water rights held	690-086-0140 (5)	2.5
Description of customers served and water use summary	690-086-0140 (6)	2.1, 2.3
Identification of interconnections with other suppliers	690-086-0140 (7)	2.7
System schematic(s)	690-086-0140 (8)	2.1, 2.4, 5.1
Quantification of system leakage	690-086-0140 (9)	2.8
Water Conservation Element (Section 3)		
Full metering of systems	690-86-0150 (4)(b)	3.1
Meter testing and maintenance program	690-86-0150 (4)(c)	3.2
Annual water audit	690-86-0150 (4)(a)	3.3
Rate structure based on quantity of water metered	690-86-0150 (4)(d)	3.6
Public education program	690-86-0150 (4)(f)	3.7
Progress report on previous WMCP	690-86-0150 (1)	3.9
Documentation of water use measurement and reporting	690-86-0150 (2)	3.11
List of measures already implemented or required by contract	690-86-0150 (3)	3.10
Water Curtailment Element (Section 4)		
Assessing water supply	690-086-160 (1)	4.2
Stages of alert	690-086-160 (2)	4.3
Triggers for each stage of alert	690-086-160 (3)	4.4
Curtailment actions	690-086-160 (4)	4.5
Water Supply Element (Section 5)		
Delineation of current and future service areas	690-086-0170 (1)	5.1
Population projections for service area	690-086-0170 (1)	5.2
Prepare schedule to fully exercise each permit	690-086-0170 (2)	5.5
Prepare demand forecast	690-086-0170 (3)	5.3
Comparison of projected need and available sources	690-086-0170 (4)	5.4
Other Items		
List of affected local governments and their comments	690-086-0125 (5)	1.1
Date for submittal of next update	690-086-0125 (6)	1.4

2.0 WATER SUPPLIER DESCRIPTION

The City of Banks provides water to residential, commercial, industrial, and irrigation customers in and around the city limits. Single family residential dwellings account for the most common and numerous water system hookups, while multi-family residential (apartments), commercial, industrial, and irrigation customers present the largest individual demands on the system. The top ten water users account for approximately 19% of the annual water consumption provided by the Banks water system.

2.1 Service Area

The City of Banks water system service area includes the area with the incorporated city limits and other contiguous or neighboring territory that the City Council determines to serve. At present, a small service area west of the City's UGB and a series of connections along the treated water transmission line running from the City's water treatment plant to the main distribution area are the only areas served that lie outside the city limits. There is currently a moratorium on creating new connections outside the city limits. A map of the current Service Area is presented in Figure 2-1.

2.2 Population Estimates – Current and Historic

The current and historic population of the Banks Water System service area is an aggregate of customers inside and outside of the city limits. Population estimates for the City of Banks were referenced from the 2007 Oregon Population Report compiled by the Portland State University Population Research Center (Proehl, 2008). The Banks City Planner provided an estimate of the population currently served outside the service area. Since the number of water connections outside the city limits has been fixed for some time, the number of customers served is assumed to have been static over the past seven years. A summary of the 2000 through 2007 service area population estimates for the Banks Water System is provided in Table 2-1.

Table 2-1
Banks Water System Service Area Population Estimates

Year	Population Within City Limits[1]	Population Outside City Limits[2]	Total Service Area Population
2000	1310	305	1615
2001	1400	305	1705
2002	1420	305	1725
2003	1430	305	1735
2004	1430	305	1735
2005	1430	305	1735
2006	1435	305	1740
2007	1435	305	1740

[1] Data from PSU-PRC "2007 Oregon Population Report" (Proehl, 2008).
[2] Data provided for 2007 by KJ Won, City Planner (earlier data are assumed)

2.3 Water Demand – Current and Historic

Current and historic water demand was estimated by Kennedy/Jenks Consultants (KJC) during preparation of a 2009 Water Master Plan (KJC, 2009), a concurrent planning effort that focuses on water system infrastructure planning for the City. Historical water use consumption was provided by the City in the form of meter records taken monthly for each customer. Water production information (system demand) was provided by the City in the form of recorded flows out of the slow sand filtration plant (SSFP) and Behrman Well. A summary of the historical population and water usage information for the past three years is provided in Table 2-2.

Table 2-2
Historic Population and System Demands

Year	Total Service Area Population	Average Day Demand (gpm)	Average Day Demand (gpcpd)	Maximum Day Demand (gpm)	Peaking Factor[1]	Maximum Monthly Demand (gpm)
2005	1735	179	149	392	2.2	304
2006	1740	187	155	393	2.1	292
2007	1740	185	153	457	2.5	261
Average:					2.3	

[1] Peaking factor is calculated as Maximum Day Demand (gpm)/Average Day Demand (gpm)
gpm = Gallons per Minute
gpcpd = Gallons per Capita per Day

The per-capita water demand over the years 2005-2007 was fairly consistent and averaged approximately 152 gpcpd. This value falls toward the upper range of national averages, which are approximately 100-150 gpcpd. Initiation of water conservation practices identified in this planning document has the potential to improve (decrease) per-capita water demand in the future.

2.4 Supply Sources

The City's water supply is obtained through diversion and treatment of surface water from Green Mountain Springs located north of the city and appropriation of groundwater from the CRB aquifer underlying the city. A map indicating the location of the City's current water sources is provided in Figure 2-2.

The Green Mountain Springs, tributaries of the West Fork of Dairy Creek, are located approximately 3.5 miles north of Banks. The springs were first developed as the City's water supply source in 1924, and consist of a large spring providing most of the water used by the City and a nearby smaller spring. The City has owned approximately 117 acres of land surrounding the Green Mountain Springs as a water source protection measure since the 1930s and 1940s. The Oregon Health Department has prepared a draft delineation of the recharge area for the springs, indicating infiltrated water contribution from approximately 1000 acres surrounding the spring sites (see Figure 2-3).

Spring flow is captured behind two concrete impoundment and diversion structures built a few hundred feet below the spring outlets. Captured water is transmitted to the City's SSFP and then to the High Zone Reservoir (0.22-MG capacity), located just downhill (southwest) of the SSFP, and a 0.07-MG chlorine contact reservoir (the North Star Reservoir). Treated water is transmitted via a high pressure zone to the Carsten Reservoirs (combined 1.5-MG capacity), located on a hill NE of the city, before delivery to water customers in the lower pressure zone. A small number of customers in the upper pressure zone are served directly from the treated water transmission line between the North Star and Carsten Reservoirs.

The City drilled and completed a 450-ft depth production well (the Behrman Well) in the CRB aquifer between 1977 and 1979. The Behrman Well is located on the south side of Banks Road about 2,000 feet SE of the Carsten Reservoirs (see Figure 2-2). Water appropriated from the well is chlorinated at the wellhead and pumped to the Carsten Reservoirs before delivery to water customers. The City drilled and completed a second production well (Well #2) in the CRB aquifer in 2005. Well #2 had not been outfitted with pump and transmission infrastructure to develop the well as a supply source at the time of the preparation of this WMCP.

2.5 Water Rights

The City of Banks diverts surface water from the Green Mountain Springs under two certificated surface water and appropriates groundwater from the Behrman Well under Permit G-7593. Groundwater Permit G-16312 is associated with the potential development of Well #2. A summary of the City's water rights and historical water use is provided below in Table 2-3.

Table 2-3
Summary of Water Rights Held by the City of Banks

Application Number	Permit Number	Certificate Number	Transfer Number	Priority Date	Type of Use	Source
S-9207	S-6516	5353	--	3-Oct-1923	Municipal	Spring (Large Spring)
S-65611	S-48173	83138	--	25-Aug-1983	Municipal	Spring (Small Springs)
G-8476	G-7593	--	T-10055	29-Sep-1977	Municipal	A well (Behrman Well)
G-15887	G-16312	--	--	5-Dec-2002	Municipal	A well (Well #2)

Application Number	Authorized Use	Max Use To Date	Average Daily Diversion			Authorized Date for Completion of Development
			2005	2006	2007	
	cfs	cfs	cfs	cfs	cfs	
S-9207	0.42	0.42	0.25	0.27	0.29	Certificated
S-65611	0.18	0.18	0	0	0	Certificated
G-8476	0.67	0.61	0.15	0.15	0.12	17-Oct-2017
G-15887	1.00	0.00	0	0	0	28-Apr-2028

Note: these water rights specify a maximum rate, and do not have an associated maximum duty.
cfs = cubic feet per second

The City's water sources do not contain listed species, are not water quality limited, and do not occur in a critical groundwater area. Diversion and appropriation of water from the City's existing sources does not present potential issues for species habitat or resource protection related concerns.

2.6 Assessment of Adequacy and Reliability of Existing Supplies

The City has historically utilized water diverted from Green Mountain Springs as their dominant water source. However, reported reductions in minimum summer flow rates and high turbidity events in the winter may limit the reliability of the Green Mountain Springs as an adequate source of water for the growing population of Banks. Minimum summer flows from the large spring have reportedly decreased from approximately 110 gpm in the early 1980s to approximately 90 gpm at present.

Turbidity levels in raw spring water may increase during high flow events in wet winter months. Spring discharge at the surface flows within a marine sedimentary bedrock channel before collecting in concrete catchment basins, and high flow events often lead to increased channel erosion and higher turbidity. Because the City's slow-sand filter is sensitive to high turbidity levels in raw water, diversion to the treatment plant is halted during high turbidity events that occur primarily in the winter season. The small springs are more prone to high turbidity due to the longer flow paths between the outlets and the catchment. The small springs are not currently utilized due to the regularity of high turbidity events. The supply from the small springs is not considered reliable.

The Behrman Well was installed in the 1970s as a source of supplemental water supply during the summer months. As the population has grown, and spring flows have decreased, the Behrman well has become the City's dominant water source, and is pumped up to 18-hours per day during the summer months. The groundwater source has a water right that permits peak pumping at a rate of 300 gpm. However, peak production from the well is reported as 230 gpm and at that rate the well is assumed to be a reliable source of water over the long term. However, the well pump and motor are aging and heavily used. This may present a future limitation due to the mechanical reliability of this water supply source.

Well #2 was drilled and completed in the CRB aquifer within 100 feet of the Behrman Well in 2005. Preliminary pump tests conducted at Well #2 suggested that a pumping rate of 300 gpm could be maintained for up to four months. However, the pumping data collected were inconclusive regarding the longer term pumping efforts and the long-term impacts on the groundwater aquifer (Golder, 2008). Well #2 is scheduled for an aquifer test that will assess the boundary conditions and recharge characteristics of the aquifer. This will support the City's interest in the further development of this groundwater source.

Table 2-4 summarizes the limitations of the City's current water supply sources. The reliable water supply rate available to the City during summer peak use periods is approximately 320 gpm, or approximately 378,000 gallons per day. This estimate is based on:

- Operation of the Large Spring at 90 gpm for a 24-hour operational scheme (129,600 gpd).
- Operation of the Behrman Well at 230 gpm for 18-hour per day (248,400 gpd).
- No supply from the small spring under Application Number S-65611 (Certificate 83138). This source is not currently used by the City due to excessive turbidity levels and is not considered a reliable source for the purpose of this estimate.

Table 2-4
Use Limitations of Existing Permitted and Certificated Water Supplies

Application Number	Use Limitations	Current Reliable Minimum Rate
S-9207	Limited summer flow rate of 90 gpm, high potential for winter turbidity levels	90 gpm
S-65611	Limited summer flow rate of 20 gpm, frequent high winter turbidity levels, currently not utilized by the City	0 gpm
G-8476	Maximum pumping rate at Behrman Well, limited by pump/motor size	230 gpm
G-15887	Well #2 installed, pumping and distribution infrastructure not currently in place	0 gpm

2.7 Emergency System Interties

The City's water supply system is self-contained and does not benefit from interties with other water providers. Interties have been deemed prohibitively expensive to date, given the City's relatively remote location more than six miles from the nearest neighboring municipality. However, the City does maintain two separate sources of water supply, the Green Mountain Springs and the Behrman Well, in the event that one source becomes unavailable for short periods of time.

2.8 Water Loss Evaluation

Calculations of unaccounted-for water were made by KJC during preparation of a 2009 Water Master Plan (KJC, 2009). Unaccounted-for water is defined as the difference between the total water produced at the two water supply sources (Green Mountain Springs and Behrman Well) and the total amount of water billed to customers. Differences between recorded treated water (leaving the SSFP and Behrman Well) and metered customer data are due to several factors including leakage losses, meter discrepancies, hydrant and main flushing, street sweeping, operation and maintenance uses, unauthorized connections, fire flow uses, and un-metered miscellaneous uses.

The average unaccounted-for water in the Banks Water System is 26.4 MG per year, or an average of nearly 27 percent of the total treated water. Table 2-5 presents a summary of the total water produced and consumed by the system and the resulting unaccounted-for water for 2006 and 2007. The fluctuation in unaccounted-for water is assumed to be due to differences in fire hydrant and main line flushing. System flushing is a common and important maintenance task, which KJC suggests continuing (KJC, 2009). This Water Management and Conservation Plan presents actions for the City to implement in order to reduce excessive unaccounted for water in Section 3: Water Conservation Element.

Table 2-5
General Water Use Characteristics

	Units	2006	2007	Average
Total Treated Water Produced	(MG)	98.4	97.4	97.9
Water Produced by Slow Sand Filtration Plant	(MG)	63.8	68.0	65.9
	(%)	64.8	69.8	67.3
Water Produced by Behrman Well	(MG)	34.6	29.4	32.0
	(%)	35.2	30.2	32.7
Total Metered Consumption	(MG)	74.4	68.7	71.5
Unaccounted-for Water	(MG)	24.0	28.7	26.4
	(%)	24.4	29.5	26.9

3.0 WATER CONSERVATION ELEMENT

Water conservation can function as an important tool in helping the City use its existing and future water supplies more efficiently. Water conservation can potentially increase system reliability by decreasing the use of the Behrman well, reduce capital expenditures on future water source development, and limit impacts on the CRB aquifer. The City of Banks adopted a comprehensive conservation program in September of 2000 and completed a WMCP in 2001. The current 2008 WMCP is the first WMCP the City has submitted for OWRD approval.

3.1 Full Metering of System

The City's water system is fully metered. Diversion from the Green Mountain Springs is metered at the outlet of the SSFP and groundwater appropriation is metered at the well head of the Behrman Well. The City also meters flow at the North Star and High Zone Reservoirs. Full metering of the City's water consumer hook-ups was completed in 1988.

3.2 Meter Testing and Maintenance Program

The City tests all customer meters prior to installation to ensure that they do not have an error in excess of ±3%. Meter tests are conducted in accordance with the standards of practice established by the American Water Works Association (AWWA, 1999, manual number M-6, 4th edition). The water department has procedures in place to re-test customer meters if meter records suggest a drifting meter or if water customers request a meter test be performed.

The City does not routinely test its supply meters. Newer magnetic meters were installed to most supply locations in 2002.

3.3 Annual Water Audit

The City, with the assistance from an intern from Portland State University, has installed Water Audit software developed and distributed by AWWA. The primary function of the software is to generate an infrastructure leakage index. The program utilizes input information on water supplied to and withdrawn from the system, unmetered loss estimates, and other parameters to produce financial and operation efficiency indicators for use by City staff and engineers. The project is currently in the data input stage; once the initial information is entered, water audit updates are relatively simple. This program will be a useful tool in monitoring overall system activity and performing future system audits

The City currently monitors treated water supply volume and sales volumes. Because the system is fully metered – with meters at all customer locations and supply sources – monthly estimates of water loss can be made.

The City does not meter construction or fire uses by State, County, or Oregon Department of Transportation contractors, but relies on an honor system for reporting these uses.

3.4 Leak Detection Program

Water losses from the system in 2006-2007 were estimated by KJC engineers to be 27%. Some of this loss may be attributed to non-metered uses (see 3.3 above), and some to leakage from the aging

treated water transmission line from the North Star Reservoir to the Carsten Reservoirs. Implementation of annual water auditing will identify water losses more accurately, and allow the City to develop a leakage detection program. The City's goal is an annual water loss of 15% or lower from all sources.

3.5 Leak Repair and Line Replacement Program

The City has identified and repaired significant leaks in the past by replacing aging water distribution line infrastructure. Plans for replacing the aging treated water transmission main between the North Star and Carsten Reservoirs have been drafted and the City is currently planning for funding this water conservation opportunity through the implementation of their Water Master Plan and Capital Improvement Program. Once the transmission line is replaced, KJC engineers predict the system should experience lower leakage loss and higher transmission capacity.

3.6 Rate Structure Based on Quantity of Water Used

The City bills customers for delivered water based in part on metered water usage. Water customers are charged a flat rate for the first 400 cubic feet per month, and a unit price for any water used above that base amount (reflecting a 2007-2008 rate increase of 10%; see Appendix). This rate structure allows water customers on a fixed income to have access to an amount of water to meet basic needs as well as providing an incentive for conservation of water use above these basic needs.

Meters are read manually and bills are rendered on a bi-monthly basis. The City maintains an accurate record of meter readings and customer billings as proof of water service provision and customer use.

3.7 Public Education Program

The City has obtained and distributed informational flyers from AWWA on water conservation measures to its customers. The City has also produced a pamphlet detailing water quality issues and backflow, and measures that their customers may take to prevent backflow. The City also has the capacity to add special alerts or messages to water bills through updated billing system software.

Golder and KJC are currently developing an informational pamphlet on water conservation and the City's WMCP for distribution to Banks water customers and non-metered residents. In conjunction with pamphlet delivery, Golder will present a water conservation workshop at a Banks public meeting in the first quarter of 2009.

3.8 Technical and Financial Assistance Programs

These programs are not required for small water providers. However, the City does provide financial assistance through its leakage repair compensation program. The City will credit a customer up to one half of their water bill if they demonstrate they have identified and repaired leaks in a timely manner. In addition to providing financial assistance, this program encourages water conservation.

3.9 Progress Report on Previous WMCP

The 2001 WMCP listed several recommendations to the City to facilitate fulfilling its water conservation and management goals. Specific benchmarks for each recommendation were not provided; however, Table 3-1 outlines the recommendations and the City's progress toward each.

Table 3-1
Progress Report on Previous WMCP Recommendations

Recommendation	Status of Action
Begin process of switching all large irrigators to TVID water	Currently, there is a moratorium on new service agreements with TVID that is expected to last until the year 2015.
Implement an odd/even day for irrigation	City ordinance instructs irrigators on odd/even usage days as emergency measures.
Assign or hire a Water System Conservation Coordinator position	Not currently hired or assigned.
Require remodels and new construction to install ultra-low flow fixtures	Not currently required.
Perform water audits on commercial customers	The City is currently developing an auditing system using AWWA Water Audit software.
Purchase and mail conservation information	The City has obtained and distributed informational flyers from AWWA on water conservation measures. The City will also host a water conservation workshop at a public meeting in March 2009.
Purchase a supply of door hangers to advise customers when conservation action is requested or required	The City has relied on mailed notifications of a curtailment plan.
Develop year-round use of the small Green Mountain spring by pursuing the install of a flocculation/ clarification system to reduce turbidity	In 2002, a flocculating clarifier was constructed for the small spring, although it is currently not operating. Due to the low flow (12-15 gpm) and generally low quality of the water from this source, the City has elected not to adopt the burdens of chemical treatment and operations maintenance associated with the clarifier at this time.
Authorize a design study for a new well south of town	The design study has not been authorized at the time of this WMCP, but is under consideration with other alternate water supply options.
Begin replacement of old steel and galvanized water lines to reduce water loss	The City has and continues to identify and repair significant leak by replacing aging water distribution line infrastructure.
Continue the moratorium on extension of water service outside City limits	The moratorium is currently active.
Be prepared to enact the provisions of the Water-Use Curtailment Plan	The City has detailed curtailment alerts and actions in its Water-Use Curtailment Plan, and is prepared to enact these provisions.

3.10 Conservation Measures Already Implemented

Banks has adopted a Water Use Curtailment Plan (city ordinance 50.23) instructing its customers on water conservation measures during periods of high demand and/or low supply. More information on the Water Use Curtailment Plan is available in Section 4 of this WMCP.

3.11 Documentation of Water Use Measurement and Reporting

The City of Banks reports monthly water use to OWRD in its Annual Water Use – Monthly Quantities Form. Water use in water-use year 2008 was submitted to OWRD on December 8, 2008.

OWRD has implemented an on-line water use reporting system, and the City intends to report its water use for water-use year 2009 on-line.

4.0 WATER CURTAILMENT ELEMENT

This Section of the WMCP describes the City's Water Use Curtailment Plan and demonstrates compliance with the requirements of the applicable Division 86 rules (OAR 690-086-0160). Curtailment planning enables the City to develop and implement proactive measures that reduce water demand while protecting the health and welfare of the community during periods of drought or catastrophic service interruption.

4.1 Curtailment History

Since 1923 the City of Banks has obtained drinking water from Green Mountain Springs, located approximately six miles north of the city in the coast range foothills. This supply was augmented by the completion of the Behrman production well in 1973. The City has experienced short and longer term disruptions in water supply. However, due to the dual spring and well sources of water, the system failures have not resulted in wide-scale loss of service.

Anecdotal information suggests that approximately 18 years ago, the motor driving the Behrman Well pump failed and was replaced. The entire pump was replaced approximately 12 years ago, which disrupted water supply from the well for approximately three days. The City of Banks experienced a longer-term loss of water from the Green Mountain Springs in February-March 1996 when a mudslide washed away the old intake structure. The City relied on the Behrman Well during this period and did not suffer from severe shortages because demands were modest at that time of year. However, the high-zone customers connected directly to the treated surface water transmission main were without City water service for two weeks. Water was provided in tank trucks by the Oregon National Guard through a Federal Emergency Management Agency program until a temporary intake was installed and service was resumed.

The City has experienced a few recent short-term water supply emergencies due to water line breaks and well system failures. Two interruptions occurred from breaks in the treated water transmission main in October-November 2007 due to a traffic-related incident that sheared off a fire hydrant twice in the two-month period. The Behrman Well failed in 2008 due to lightning strike; the system was repaired within 12 hours of the discovered failure. Adequate system storage allowed these failures to be repaired in a timely manner without requiring the implementation of water use curtailment.

4.2 Curtailment Plan

Rapid population growth since the mid-1990s has sharply increased the City's dependence on groundwater resources from the Behrman Well to meet peak summer demands. And while the City has replaced several sections of their pipelines as recommended in the 1998 Master Plan Update, sections of older pipe remain in the distribution system and pose a potential for system supply disruption should they fail. The City currently has no redundancy in its water supply system during periods of high demand, and a disruption in the water supply system could lead to a water shortage. The City currently has a storage capacity to provide approximately 5.5 days of water supply without the implementation of curtailment measures. The City is considering the feasibility of using Well #2 as a source of emergency water supply, but the well does not have adequate infrastructure (pump and distribution tie-in) to be utilized at this time.

In the event of a water shortage, the City's Water-Use Curtailment Plan (authorized by City Ordinance 50.23) defines the system triggers that initiate actions that City will take in the event of a water shortage emergency and dictates the manner in which water use curtailment is communicated,

implemented, and enforced. The curtailment plan may be implemented for rapidly developing emergencies such as those due to natural disasters or infrastructure failure, as well as longer-term water supply reductions due to prolonged drought.

Currently the Behrman Well relies on an aging pump and motor that is used up to 18 hours per day during peak demand periods. A mechanical failure of the production well infrastructure during the summer months would likely cause a water shortage emergency. The duration of this type of emergency would depend on the time required to repair or replace the failed component, which could last up to several weeks and require water use curtailment.

The impacts that a long-term drought would have on the City's water supply are uncertain. It is possible that an extended drought could cause the yield of the springs to decline or groundwater levels to drop in the well. A reduction in the pumping capacity of the well due to aquifer drawdown or a lower flow from the springs could produce water supply shortages of longer duration requiring water use curtailment.

The curtailment plan prioritizes the use of limited water supplies to protect public health and safety during an emergency, and provides for gradually increasing levels of voluntary and mandatory curtailment actions to address a water supply shortage. Water use is prioritized in the following manner:

1. Minimum essential indoor residential use and fire protection;
2. Minimum essential indoor uses by nonresidential customers, including schools, commercial establishments and Banks Lumber;
3. Outdoor uses and discretionary indoor uses by all customers; and
4. Service to new customers who are not served at the time the water shortage occurs.

The amount of water required for essential indoor uses is subjective and depends on the extent to which current water-use patterns are modified by customers. Without significant changes in behavior, average indoor residential water use in Banks is estimated to be about 75 to 80 gallons per capita per day (gpcpd). If the City requested that water use be curtailed due to a shortage, essential use could be expected to be about 70 gpcpd. Public health could still be maintained with lower uses, but significant changes in water use behavior would be needed. The amount of water required to maintain service for categories 2 and 3 listed above would depend on the time of year that the water shortage occurs. Essential indoor uses at the schools would be small during the summer months, but significant during the school year. Conversely, most outdoor uses are generally concentrated from mid-June to mid-September.

4.2.1 Stages of Alert

The City of Banks Water Curtailment Plan prescribes three stages of alert in the event of a water shortage. These increasingly sever water shortage stages trigger predetermined levels of response that prompt notification of specific reductions in use. The shortage levels used to indicate each stage of the curtailment plan are based on critical system operating conditions.

Table 4-1 summarizes the three stages of alert, the shortage conditions that trigger each stage, and the peak water use reduction goal for each stage due to curtailment actions. These shortage conditions and reduction goals are based on summer operation schemes when water demand is at a maximum, and assume alternative supplies (i.e., water from interties or secondary sources) are not available. If alternate backup water supplies are developed the City may reevaluate the conditions used to define

shortage levels, as system redundancy will reduce the potential for shortages in the event that flows from one source of supply are interrupted.

Table 4-1
Water Shortage Stages, Triggers, and Reduction Goals

Stage	Shortage Condition Trigger	Peak Water Use Reduction Goal
1 "mild"	Well running time greater than 20 hrs/day to fill Carsten Reservoirs	15 %
2 "moderate"	Carsten Reservoir water storage approach minimum 685,000 Gallons of Storage (tank elevation 403 feet) Or Well running time of 24 hrs/day (i.e., daily demand exceeds supply) Or Well System failure and anticipated repair/recovery of greater than 48-hours (2-days)	30 %
3 "critical"	Carsten Reservoir below water storage minimum 685,000 Gallons of Storage (below tank elevation of 400 feet) Or Long-term (>3 day) service disruption of spring or well water sources	60 %

4.2.2 Triggers for Each Stage of Alert

The City currently relies on water from Green Mountain Springs and the Behrman Well to meet water demand in the service area, and utilizes storage in the Carsten Reservoirs to meet peak demands. The adequacy of the City's water supply is currently gauged by monitoring the operating water levels in the Carsten Reservoirs. Therefore, water levels in the Carsten Reservoirs and the ability of water sources to maintain reservoir levels are used as benchmarks for initiating curtailment actions.

The City relies heavily on production from the Behrman Well to keep the Carsten Reservoirs full and meet water demand during the summer months. The first water shortage stage is triggered by excessive well operating time. If the well pump is running for more than 20 hours per day in order to fill the Carsten Reservoirs the first trigger for implementation of water-use limits will be met.

Second tier curtailment conditions will be triggered if the Behrman Well runs continuously, indicating that daily demand is in excess of available water supply. Alternately, second tier curtailment will occur if the water surface elevation of the Carsten Reservoirs falls below 403 feet. This water level benchmark is meant to provide response time for implementing water-use curtailment measures in order to avoid tank water levels below 400 feet elevation (the level necessary to meet emergency fire flows, if necessary).

Third tier curtailment conditions will be triggered if water levels in the Carsten Reservoirs fall below 400 feet. A conservative allowance for emergency fire suppression use, determined from the Insurance Services Office (ISO) rating for the City, requires a minimum available water volume of approximately 685,000 gallons. With both tanks in service, a water surface elevation of 400.2 feet in the Carsten Reservoirs provides a volume of 685,000 gallons.

Without the benefit of secondary water sources or system interties, the loss of either the Large Spring or the Behrman Well during the summer would result in supply deficits. Should the City be faced with the loss of either supply source that anticipates a 3-day repair schedule, a third tier condition would be triggered.

4.2.3 Curtailment Actions

The three stages of curtailment actions have been developed assuming that shortages are generally going to occur during peak demand periods in the summer. The plan concentrates first on reducing outdoor water use. If equipment failures result in a supply shortage at a time when outdoor water use is relatively low, then the emphasis of the rationing methods will be shifted to non-essential indoor use.

The curtailment actions for each of the shortage conditions are as follows:

Stage 1: Request major landscape irrigation customers to curtail all outdoor water use. Major irrigation customers currently include Arbor Village Homeowners Association, Quail Hollow Apartments, Banks Lumber Company, the Banks School District #13, and the Banks Sunset Park Association. Identify alternate day irrigation schedules for schools, parks and green space. Issue notice to public requesting all users to voluntarily conserve water.

Stage 2: Mandate major landscape irrigation customers curtail all outdoor water use. Mandate other users limit outdoor water use per the following steps:

1. Unattended outdoor irrigation of turf and plants limited to the period between 5:00 P.M. and 9:00 A.M.
2. Limit the length of time that unattended irrigation can occur in each sprinkler zone to 20 minutes per day.
3. Limit irrigation to alternate day schedule. Even house numbers may water on even days. Odd house numbers may water on odd days.
4. Prohibit home washing of cars or hosing down of patios, walkways and other surfaces.

Stage 3: Order suspension of all outdoor water use and curtail indoor use to limit all customers to uses for public health and preparation of food.

Curtailment requests for reduction of water use should be supported by a public information program aimed at educating the community about water use so they may understand how modifying their habits can affect water consumption. When issuing a notice to the public, examples of ways to conserve water should be provided. For example, the public notification for a First Stage condition should be aimed at outdoor uses. These uses can form a significant proportion of summer residential use and tend to be more discretionary in nature. Specific conservation measures that can be recommended in the notice include the following:

- no landscape irrigation during daylight hours to reduce evaporation;
- limit length of time irrigation system is on to reduce waste from runoff and over watering;
- landscape irrigation no more than three days per week; and
- no home washing of cars or hosing down of patios, walkways, and other surfaces.

Public notification procedures to communicate water curtailment measures should be defined in advance. Press releases through radio, newspaper, and television should be utilized to reach the entire community. Door hangers should also be purchased in advance so that in an emergency all customers can be notified directly and quickly.

These measures are further supported by the public information program that provides guidance and suggestions on water conservation (see Section 3.8).

5.0 WATER SUPPLY ELEMENT

The City of Banks currently has the supply and storage capacities needed to service its existing customers. Planned land use and the population growth associated with water usage forecasts suggest the City will need to increase its water supply in order to keep up with rising demand. The following section details current and future water needs, and recommends potential sources of water to meet these needs.

5.1 Current and Future Service Area

The City of Banks water system service area includes the area within the incorporated city limits and other contiguous or neighboring territory that the City Council determines to serve. At present, a small service area west of the City's UGB and a series of connections along the treated water transmission line running from the City's water treatment plant to the main distribution area are the only areas served that lie outside the city limits. There is currently a moratorium on creating new connections outside city limits; the City is currently reviewing options for expanding its UGB. A map of the current Service Area and adjacent land (currently zoned as agriculture and forest land) that may be incorporated into a future planned service area are presented in Figure 5-1.

5.2 Population Projections

The projected future population of the Banks Water System service area is an aggregate of customers living inside and outside of the city limits. New water connections outside the city limits are no longer allowed, and the number of customers served in that area is assumed to remain at current levels into the future (305 residents). The number of water customers inside the city limits is expected to grow as the City builds out to its UGB. The City's land use plan estimates that full build-out to the UGB will occur by 2024, at which time the total population of the City is estimated to be 3739. A summary of the service area population estimates for the Banks Water System over the next 20 years (between 2008 and 2028) is provided in Table 5-1.

Table 5-1
Banks Water System Service Area Population Estimates

Year	Population Within City Limits[1]	Population Outside City Limits[2]	Total Service Area Population
2008	1570	305	1875
2013	2245	305	2550
2018	2920	305	3225
2023	3595	305	3900
2028	3739	305	4044

[1] Data 2008 - 2028 provided by KJ Won, City Planner, assuming a uniform average growth rate over the period from 2007 to 2024, when full build-out is expected to occur.
[2] Data provided by KJ Won, City Planner.

5.3 Water Demand Forecast

Water demand forecasts were estimated by the City Engineer (KJC) during preparation of a 2009 Water Master Plan (KJC, 2009), a concurrent planning effort focused on water system infrastructure planning for the City. A summary of the projected population and water usage information for the Banks Water System over the next 20 years (between 2008 and 2028) is provided in Table 5-2. Future water demand projections were based on future population estimates (see Section 5.2) and estimated per-capita use based on water billing and production data for the past three years. It was assumed that the rate of increase in water use for commercial and industrial users will follow the same pattern as for the residential population.

Table 5-2
Projected Population and System Demands

Year	Total Service Area Population	Average Day Demand (gpm)	Average Day Demand (gpcpd)	Maximum Day Demand (gpm)	Peaking Factor[1]	Maximum Monthly Demand (gpm)
2008	1875	198	152	456	2.3	304
2013	2550	269	152	621	2.3	414
2018	3225	340	152	785	2.3	523
2023	3900	412	152	949	2.3	633
2028	4044	427	152	984	2.3	656

[1] Peaking factor is calculated as Maximum Day Demand (gpm)/Average Day Demand (gpm)
gpm = Gallons per Minute
gpcpd = Gallons per Capita per Day

5.4 Comparison of Water Demands and Available Sources

A discussion of the City's reliable water sources was provided in Section 2.6, and summarized in Table 2-4. The reliable water supply rate available to the City during summer peak use periods is an instantaneous 320 gpm, or approximately 378,000 gallons per day.

Given that the future anticipated Average Day Demand of 427 gpm by 2028 is 133% of the current available supply (320 gpm), and the 2028 Maximum Day Demand of 984 gpm is 308% of the current supply, the City will need to minimize water loss from the system, encourage water conservation by customers, and develop additional sources of supply in the coming years.

The City's conservation planning will focus on reducing water loss from 27% to 15% of diverted water or less in order to maximize delivery of currently available water sources. Achieving a 15% water-loss goal would conserve over 14 MG per year. This is equivalent to approximately 729 hours of pumping at the Behrman Well.

The City's overall conservation goal is to reduce per capita water demand on the system from 152 gpcpd toward the national average (near 125 gpcpd). This program will require the implementation of water conservation measures as identified in Section 3 of this WMCP, continued outreach to the community, increased rate structures for service beyond basic services, and the replacement of existing infrastructure. However, even with full implementation and success of these conservation

measures, reductions to 15% leakage loss, and a reduced demand to 125 gpcpd the City is projected to have a water supply deficit requiring additional sources of supply by 2018 (see Table 5-3).

Table 5-3
Projected Future Water Supply Balance after Conservation Efforts

Year	Maximum Day Demand (given 152 gpcpd)	Current Firm Source Water Availability[1]	Current Water Delivery (given 27% leakage)	Estimated Water Supply Balance[2]	Maximum Day Demand (assuming 125 gpcpd)	Potential Water Delivery (assuming 15% leakage)	Estimated Water Supply Balance[3]
	(gpm)	(gpm)	(gpm)	(gpm)	(gpm)	(gpm)	(gpm)
2008	456	320	233.6	-222.4	375	272	-103
2013	621	320	233.6	-387.4	511	272	-239
2018	785	320	233.6	-551.4	646	272	-374
2023	949	320	233.6	-715.4	780	272	-508
2028	984	320	233.6	-750.4	809	272	-537

[1]refer to Section 2.6 Assessment of Adequacy and Reliability of Existing Supplies
[2]calculated as current water delivery minus the current Maximum Day Demand
[3]calculated as potential water delivery (with goal of 15% loss) minus potential Maximum Day Demand (with less water use per capita than current)

5.5 Water Rights Implementation Schedule

The City plans to continue to develop their groundwater permits in the coming years. A complete list of the City's water right holding are presented in Table 2-3 and options for all water rights are discussed in Section 5.6. This section focuses on developing water right permits that require additional development to become permanent certified water rights. Table 5-4 presents the available groundwater permits that are not yet fully utilized (put to beneficial use) and certificated. These permits are scheduled for development and partial or full certification of beneficial use within the next three years.

Additional evaluation of water right options, to increase the City's ease of use and flexibility under these permits, may be explored in the years following the development of Well #2. The following schedule outlines the current proposed schedule for putting the groundwater permits to beneficial use.

5.5.1 Water Right Permit Development Actions for 2009 to 2014

1) The City will pump test and develop the wellhead infrastructure and conveyance for Well #2 under Permit G-16312. The permit will be amended to include Well #1 and other potential points of appropriation (POA) and for an area identified for well field development (Southwest Wellfield, Figure 5-2).

2) The City will amend Permit G-7593 to include Well #2, other potential POA, and an area for well field development (Southwest Wellfield, Figure 5-2).

3) A claim of beneficial use will be completed for the final 0.06 cfs (27 gpm) of appropriation under Permit G-7593, and the permit will be certified through a claim of beneficial use.

4) A partial perfection of Permit G-16312, of 25% or more, will be made if the mutual capacity of the Behrman Well and Well #2 prove sufficient to support the production of the combined permits.

Table 5-4
Summary of Unperfected Water Right Permits

Application Number	Permit Number	Certificate Number	Transfer Number	Priority Date	Type of Use	Source
G-8476	G-7593	--	T-10055	29-Sep-1977	Municipal	A well (Behrman Well)
G-15887	G-16312	--	--	5-Dec-2002	Municipal	A well (Well #2)

Application Number	Authorized Use	Max Use To Date	Average Daily Diversion			Authorized Date for Completion of Development
			2005	2006	2007	
	cfs	cfs	cfs	cfs	cfs	
G-8476	0.67	0.61	0.15	0.15	0.12	1-Oct-2017
G-15887	1.00	0.00	0	0	0	28-Apr-2028

5.5.2 Water Right Permit Development Actions for 2014 to 2020

1) The City will assess the viability of developing the Golf Course well with the present owner, Quail Valley Golf Course, under both Permits G-7593 and G-16312. This could be done by adding the Quail Valley Well as an additional POA to both water rights. A hydrogeologic determination of "same source" would also have to be completed.

2) The hydrogeologic and engineering viability of the Southwest Wellfield will be assessed.

3) Investigate feasibility for integrating Aquifer Storage and Recover (ASR) into water supply system. ASR can optimize the existing water supply system by storing available winter flow from senior water rights at the spring sources.

5.5.3 Water Right Permit Development Actions for 2020 to 2028

The construction phases of the options selected will be completed, if necessary.

5.6 Source Alternatives Analysis

The City plans to meet future system demands through conservation measures that will minimize water loss from the system, encouraging water conservation by customers, and developing additional sources of supply in line with the City's current water right holdings. Demand projections, outlined in Section 5.3, indicate the City cannot currently meet the 2008 Maximum Day Demand, and will not meet the Maximum Monthly Demand by 2013. In addition to conservation measures, additional water supply will be required to meet these demands. A number of supply options are reviewed in this section and are categorized under the general areas of near-term and long-term supply options.

In the short term, the City will continue measured development and exploration of additional groundwater resources to ensure near-term municipal demands are met and to develop system redundancy to supply water in the event of primary water source disruptions. In the long term, the City will continue to evaluate options to develop interconnections with regional water suppliers.

5.6.1 Near-term (one to five years)

Currently, several short-term source water alternatives exist for the City of Banks. These options include completing the development of the existing ground water right permits in Table 5-4, developing Well #2, exploring options for utilization of the Quail Valley Golf Course Well, and assessing options for the Southwest Wellfield. The City may also consider improving the delivery of water supplies on existing spring water right certificates by investigating options to transfer spring water rights to groundwater rights (Sellers Road Wellfield); thereby reducing or eliminating the need for filter treatment.

5.6.1.1 Well #2 Wellhead Development

This supply option will provide near term additional water supply to the City and act as a back up well to the Behrman Well. Development of the Well #2 option may yield up to 450 gpm of reliable water supply. If the well is found to have the capacity to sustain this amount of water for a sufficient period of time, the development of the pumping and conveyance system could increase the reliable supply by 220 gpm, assuming that the Behrman Well was not in operation. This option will require a long-term constant-rate pumping test to prove out the pumping capacity and accurately size the pumping system. Other infrastructure required will include the wellhead design and construction, a chlorine treatment system, and a short conveyance pipeline to intertie with the Carston reservoirs.

5.6.1.2 Quail Valley Golf Course

The Quail Valley Golf Course located to the east of the City of Banks has an existing groundwater well which could be a potential alternative source of water. Current water rights for this well are permitted for a maximum rate of 0.89 cubic feet per second (399 gpm) for supplemental irrigation. This well is presently pumped to storage ponds on the golf course. The irrigation water is then pumped from the pond to irrigate the golf course when Tualatin Valley Irrigation District cannot supply irrigation water to the course. If found to be hydraulically connected, this well could yield a significant municipal water supply under the City's existing water rights. Use of this water supply option would require a Memorandum of Understanding (MOU) between the City and Quail Valley Golf course regarding their need for emergency use, and annexation of part or all of the golf course and surrounding lands. A water supply pipeline would be constructed from the well to an intertie in the of the Behrman well to tie into the existing pipeline along NW Banks Road at the Behrman well (see Figure 5-3), which would be approximately 4000 feet long.

5.6.1.3 Sellers Road Wellfield

This water supply option would require a hydrogeologic feasibility study of the basalts above the existing spring sources north of the City. This would include drilling and pump testing a well, and would require a water right transfer of a portion of the spring water right to the new groundwater well. The City maintains two spring intakes north of town, located off Sellers Road. The supply from the springs has experienced long-term reductions in production capacity over the last 20 years and the surface water captured requires expensive filtration and treatment to meet drinking water quality standards. If this option proved successful, the water drawn from the groundwater source in connection with the springs could be increased from the current 90 gpm to the full water right of 269

gpm, an increase of 179 gpm. The groundwater from the wells is unlikely to require filtration treatment. The potential improved water quality could greatly reduce or eliminate the cost of operating the City's slow sand filter. The hydrogeologic feasibility study would include refining a hydrogeologic conceptual model, selecting a well location based on hydrogeologic features, legal access Sellers Road, and then drilling a test well and completing a pumping test.

A successful outcome to the feasibility study could initiate the development of a well field along Sellers road (see Figure 5-4). Two to five wells could be drilled to a depth of 50 to 350 feet, with an estimated production of approximately 50 to 150 gpm each. The development goal would be to reach 269 gpm, the total water right now available at the current spring sources. In addition to drilling the wells, other infrastructure would be required including power supply, approximately 3500 feet of pipeline conveyance from the new wells to a tie-in at the existing spring intake, pumps and motors, and a control system for operations.

5.6.1.4 Proposed Well Field Southwest of City Center

Located to the southwest of the City of Banks is an area of land that has been considered as a possible location for a new well field (Figure 5-2). The location is to the west of Nehalem Hwy between NW Wilson River Hwy and NW Dierick Road. This land is currently being used for agricultural purposes, but may be in a location which could produce significant quantities of groundwater. It is proposed that two wells could be drilled in this area. A pipeline would be constructed to tie in to the existing water distribution system for the City to the north along S Main Street, and would be approximately 2500 feet in length (see Figure 5-3). The wells may be planned in conjunction with construction of a storage tank on the south side of the City, offering operational advantages for the water distribution system. The City's junior water right permit allows for development of up to 1cfs (~450 gpm) of additional water supply from the CRB aquifer. A 300-gpm portion of Permit G-16312 could be available for development after the successful development of Well #2. Similar production wells completed in the CRB aquifer in the area have production rates ranging from approximately 100 to 500 gpm (Squire, 1994). A new well located on the south side of town may encounter as much as 400 feet of overburden sediment, and would benefit from being drilled at least 400 feet into the CRB aquifer, for a total depth of approximately 800 feet.

5.6.2 Longer-Term Supply Options (five to 20 years)

Over the long term, the City will continue to evaluate options to develop interconnections with regional water suppliers. The City may also consider optimizing long-term production from the CRB aquifer by developing an Aquifer Storage and Recovery (ASR) Program. This program would allow the City to store excess winter water from the spring water right certificates, or another source, into the CRB aquifer wells in and around the City Center (Behrman Well, Well #2, and potentially the Quail Valley Well and the proposed Southwest Wellfield).

5.6.2.1 Non-potable Water Delivery from Tualatin Valley Irrigation District (TVID)

The City has considered purchasing non-potable water from TVID in order to supply large-volume water customers with an alternative source of irrigation water. This arrangement has the potential to significantly reduce potable water use by these customers and thus provide "additional" potable water to meet residential water needs.

A purchase agreement with TVID would need to be accompanied by concurrent water rights amendments to allow use of TVID water to irrigate land serviced by the City, as well as a modest

investment in infrastructure to allow delivery of non-potable water to large-volume irrigation users. It is our current understanding that there is a moratorium on new service agreements with TVID that is expected to last until the year 2015. However, the status of moratoriums can change on a year-to-year basis and Banks should begin planning and negotiations with TVID at this time in order to be ready to take advantage of a potential TVID connection when the opportunity arises.

5.6.2.2 Install Pipeline to Develop Interties with Neighboring Water Providers

Developing interties with neighboring water providers has the potential to provide a significant source of water to the City, as well as a reliable redundant supply in the event of a water supply failure from one or more of the system's major water sources. Intertie construction and purchasing water from outside sources is also the most expensive option for developing additional/redundant supply. Interties with the City of Forest Grove, the City of North Plains, the Joint Water Commission and/or the Tualatin Valley Water District may be considered. It is suggested that an intergovernmental agreement with one or more of these water providers be drafted before pipeline development is conducted.

5.6.2.3 Aquifer Storage and Recovery

An ASR system requires a significant alternate source of water supply to recharge a subsurface reservoir. Banks has one marginal near-term option and one long-term option for alternate water sources that could be used to recharge the CRB aquifer near the town center.

- Near-Term Source: Winter water supply in excess of demand from the Water Treatment Plant or the groundwater developed under the Sellers Road well field concept could be used to develop a ASR project at the Behrman Well or Well #2. However, the small volume of excess winter water from the Water Treatment Plant is not an economically viable option for ASR. The Sellers Road well field supply capacity is currently uncertain and will not be known unless the concept is developed. This limits the near-term options for ASR.
- Long-Term Source: Water supply contracts with regional suppliers or other small cities may include provisions for off-peak water delivery at a significantly reduced cost per gallon. If this is the case, the City may consider storing winter water purchased through such a contract for an ASR system utilizing Well #2 or the Behrman Well.

ASR is a water management approach that typically uses wells to store treated drinking water in a suitable aquifer system, and recovers that water through the same wells at a later date. Aquifer storage displaces the native groundwater and effectively creates an underground reservoir of water than can be recovered for a wide variety of applications. ASR systems have been designed and operated to meet a wide range of objectives at sites with many different physical and hydrological conditions and water sources. The number of active ASR projects in Oregon has increased from zero in 1995 to 10 in 2008, with at least 20 wells in use or in development.

ASR systems are often operated to take advantage of available water treatment plant capacity during winter months to store treated water, and recover that water through wells during the summer months to help meet peak demands. Recovered water quality in most ASR systems generally reflects the source water, although some mixing with native groundwater does occur. In many cases, ASR systems can be designed to meet a primary objective as well as to provide several secondary benefits. In addition to providing a source option, the potential benefits of a Banks ASR system include:

- Optimization of water treatment plant capacity, by using recovered ASR water to meet peak demands and extend the length of time before water treatment facility expansion is required;

- Storage capacity can be added at locations within the water supply system where demand is increasing, where there is a benefit to enhancing chlorine residuals, or where there is a benefit to delivering water directly to different pressure zones;
- Creation of environmental benefits through reduction of stress on water-related habitats during drought periods.

An ASR well will deliver water at the rate associated with any appropriately designed water supply well. The target aquifer systems are usually confined systems both to provide a groundwater protection benefit, and to limit the potential for the interaction with nearby shallow domestic wells and surface water features. Consequently, Banks-area ASR wells would have the same location targets and potential yields as the groundwater supply well options. Based on the evaluation of the Behrman Well, Well # 2 and the Quail Valley Well, the most likely yield of any new ASR well would be near 300 gpm. The well log review indicates that where wells encounter greater thickness of higher permeability basalts, well yields are substantially higher.

Because recharge rates in ASR wells are typically held to 75% of the production rates, a 300-gpm production well would recharge in the vicinity of 225 gpm. Over a 6-month recharge period, approximately 58 MG would be stored in the subsurface. If 90% of this volume were recovered to the system with a single well, it would require approximately 4 months of pumping to recover the stored water.

Groundwater rights are not required for ASR well operations. The permitting process requires a valid water right to appropriate the source water for storage, and an assessment of the potential for impacts to nearby groundwater users. Because ASR systems typically operate in a fashion that has no net impact on the annual groundwater budget, it is more likely that an ASR system would be viewed as having less impact on nearby surface water and groundwater supplies than a groundwater extraction wellfield. Consequently, ASR permitting is likely to be less costly, require less stringent mitigation planning, and has a greater chance of success than obtaining a new groundwater right.

In order to evaluate the feasibility of developing an ASR operation to integrate with The City of Banks' water supply system, the city should evaluate the following conditions:

- Identify whether ASR development costs at Well #2 are higher or lower than the costs to build onsite reservoirs.
- Evaluate whether there are portions of the service area that could benefit from additional pressure, chlorine residual, or supply in addition to the benefit of having an additional source in the event of WTP shutdown or loss of another water supply sources due to some other system failure.
- Evaluate options for additional alternative sources outside the City including additional local water rights, options for teaming with other Cities to develop a co-owned and operated ASR system, and regional water supply options that include reduced winter water rates that could benefit ASR system development.

5.7 Quantification of Maximum Rate and Monthly Volume (Request "Greenlight" Water)

OAR 690-086-0170(6) requires a quantification of the maximum rate of withdrawal and maximum monthly use if water allocated under existing permits is necessary to meet demands in the 20-year planning horizon. As described above in Table 5-2, the City's water demand by 2028 could exceed a Maximum Day Demand of 984 gpm (1.42 mgd) or approximately 2.19 cfs. Therefore, in addition to

the firm supply of 320 gpm (0.46 mgd) from wells and springs, an additional 1.2 mgd or 1.73 cfs will be needed from the City's water right permits and certificates.

Given that current Maximum Day Demand is in excess of reliable supply, the City requests that OWRD "green-light" the full remaining undeveloped portion of both Permits G-16312 and Permit G-7593, in the amount 1 cfs (448.83 gpm) and 0.06 cfs (27 gpm) respectively. This green-light water is required to provide necessary water supply and increased instantaneous supply to meet peak events over the 20-year planning horizon.

5.8 Mitigation Actions under State and Federal Law 690-086-0170(7)

Under OAR 690-086-0170(7), for expanded or initial diversion of water under an existing permit, the water supplier is to describe mitigation actions it is taking to comply with legal requirements of the Endangered Species Act (ESA), Clean Water Act and other applicable State or Federal environmental regulations. The City will obtain all required permits prior to its initial diversion of water under its water right permit should it decide to develop a water diversion requiring state and federal permitting.

5.9 Acquisition of New Water Rights 690-086-0170(8)

Under the present growth and water use projections, if the City can successfully implement plans that fully utilize their existing water rights and implement conservation measure to control annual losses, then the City anticipates needing no new water rights until approximately year 2028. However, the implementation of all the City's water rights is dependent on hydrogeologic uncertainties associated with developing groundwater sources. In the event that the available options discussed in this document provide incomplete satisfaction of the existing water rights, the City of Banks reserves the right to revisit this plan and pursue new water rights and examine opportunities for purchasing existing water rights.

6.0 REFERENCES

American Water Works Association. 1986. *Manual M-6, Water Meters – Selection, Installation, Testing and Maintenance.* Third Edition.

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Robert E. Meyer Consultants, Inc. 1995. *City of Banks Water System Master Plan.* February, 1995.

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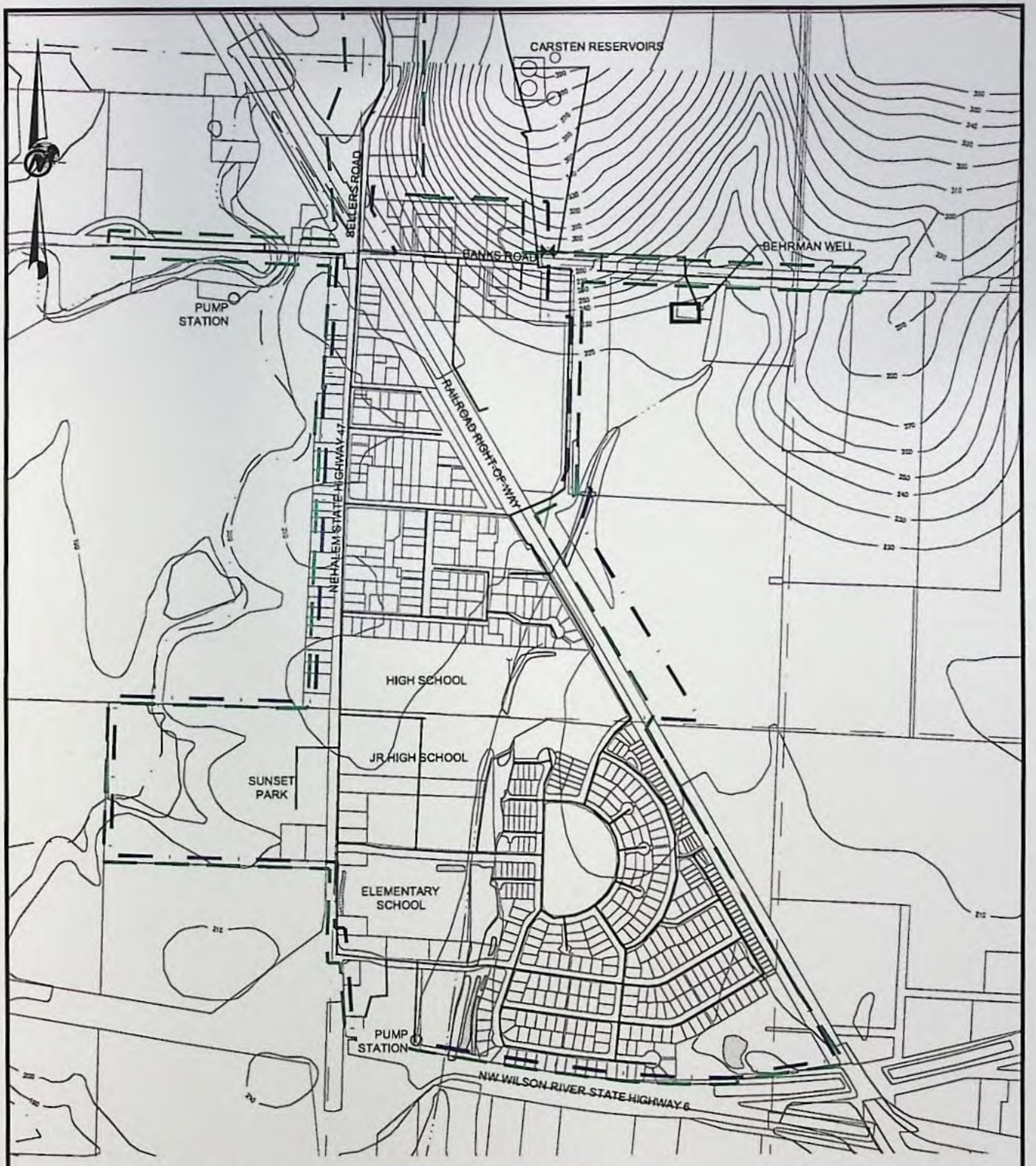
APPENDIX

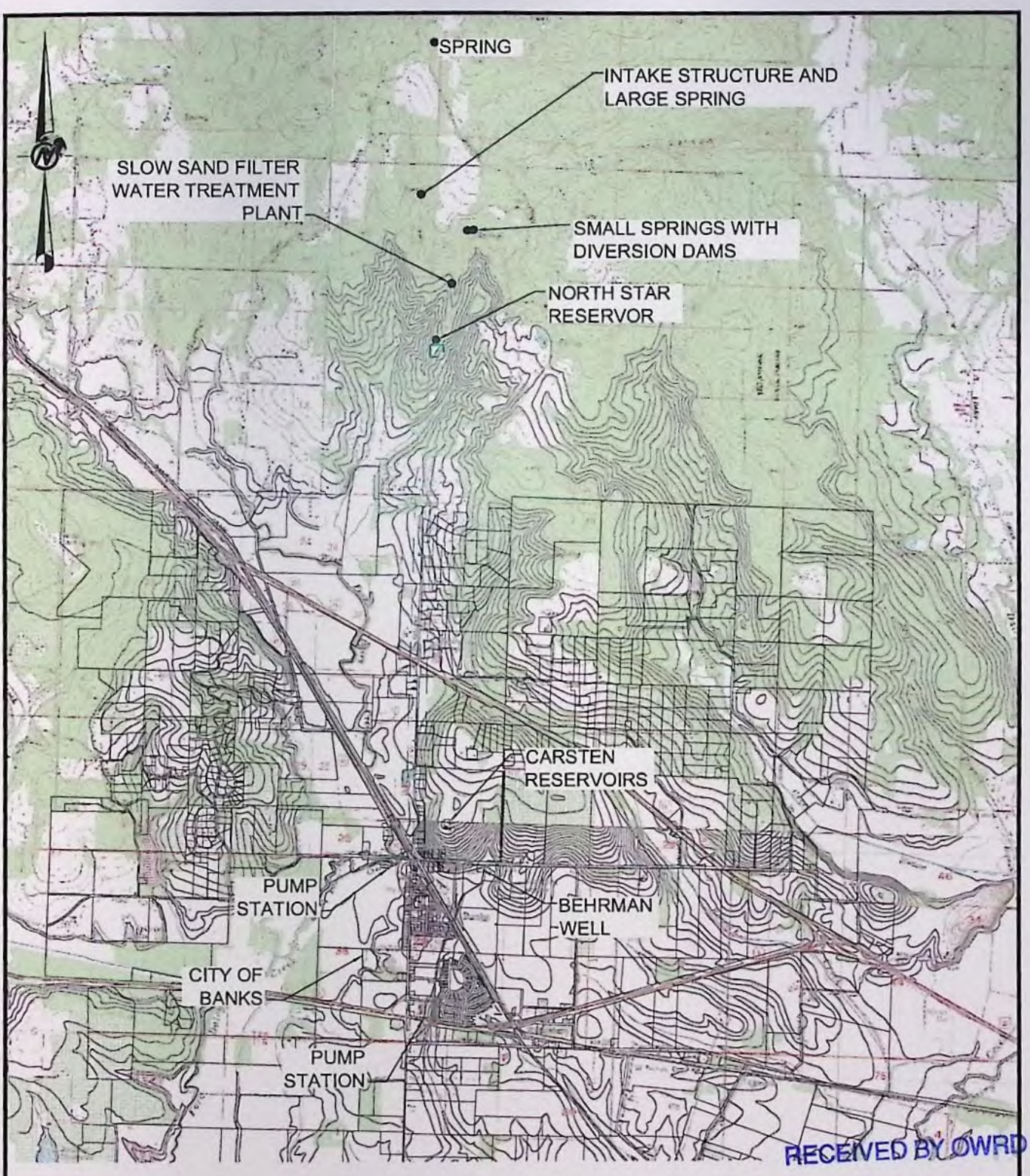


GENERAL LEGEND

- STREAMS
- QUARTER SECTIONS
- TAX LOTS
- CITY LIMIT
- URBAN GROWTH BOUNDARY
- SERVICE AREA

0 800 1,600
SCALE IN FEET

FIGURE **2-1**
CURRENT SERVICE AREA
KJ|CITY OF BANKS WATER PLAN|OR (US) | WMCP-BANKS



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OCT 2 2017

SALEM, OR

GENERAL LEGEND

STREAMS

TAX LOTS

URBAN GROWTH BOUNDARY

0 3,500 7,000

SCALE IN FEET

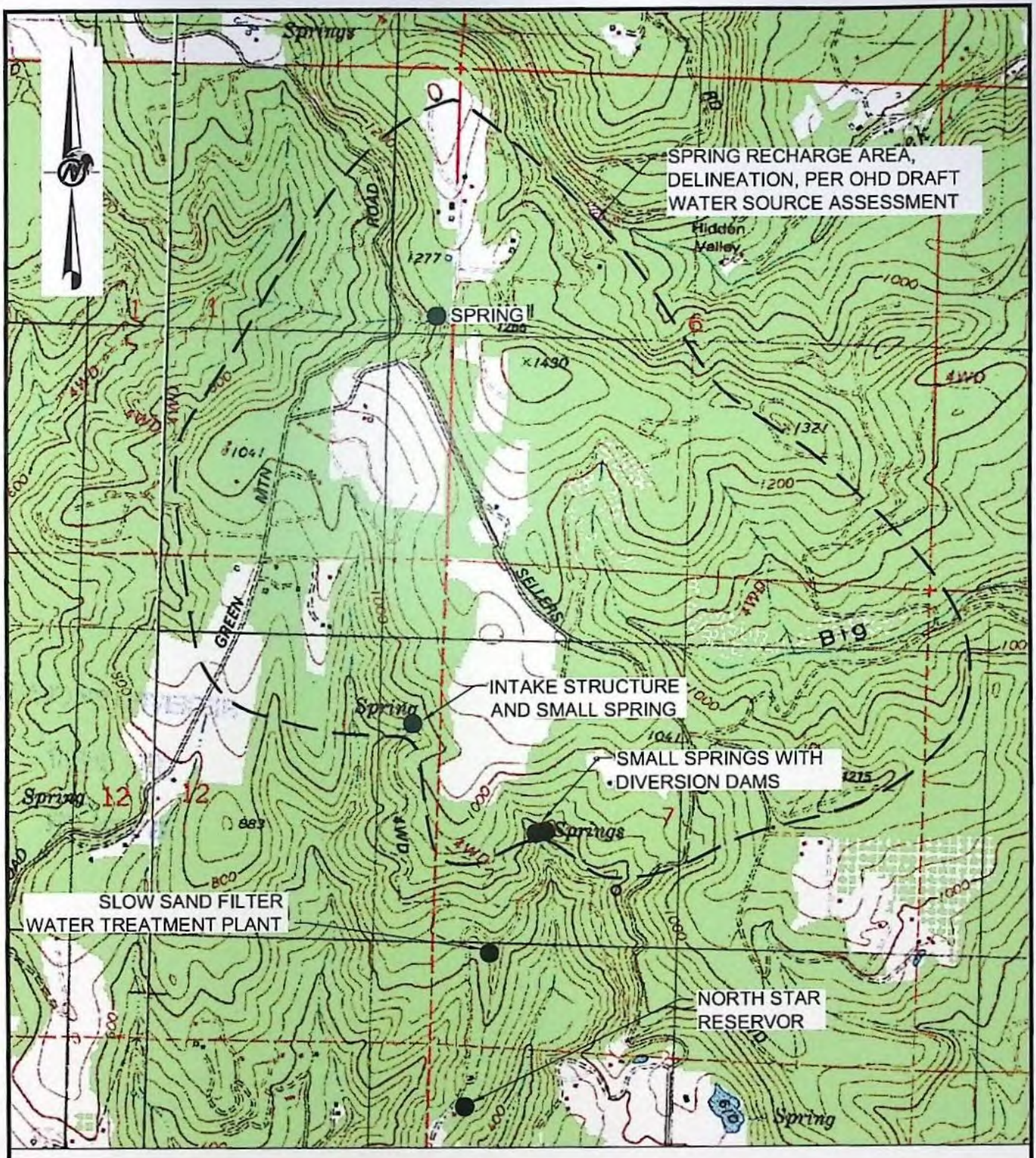
FIGURE **2-2**

CURRENT WATER SOURCES

KJ|CITY OF BANKS WATER PLAN|OR (US) | WMCP-BANKS

K:\CAD\Projects\2007\07399792v2\0739979201-F2_F4r2.dwg | FIGURE 2-2 | Mod: 03/13/2009, 11:49 | Plotted: 03/13/2009, 11:56 | SSimmons

Golder Associates



RECEIVED BY OWRD

OCT 2 2017

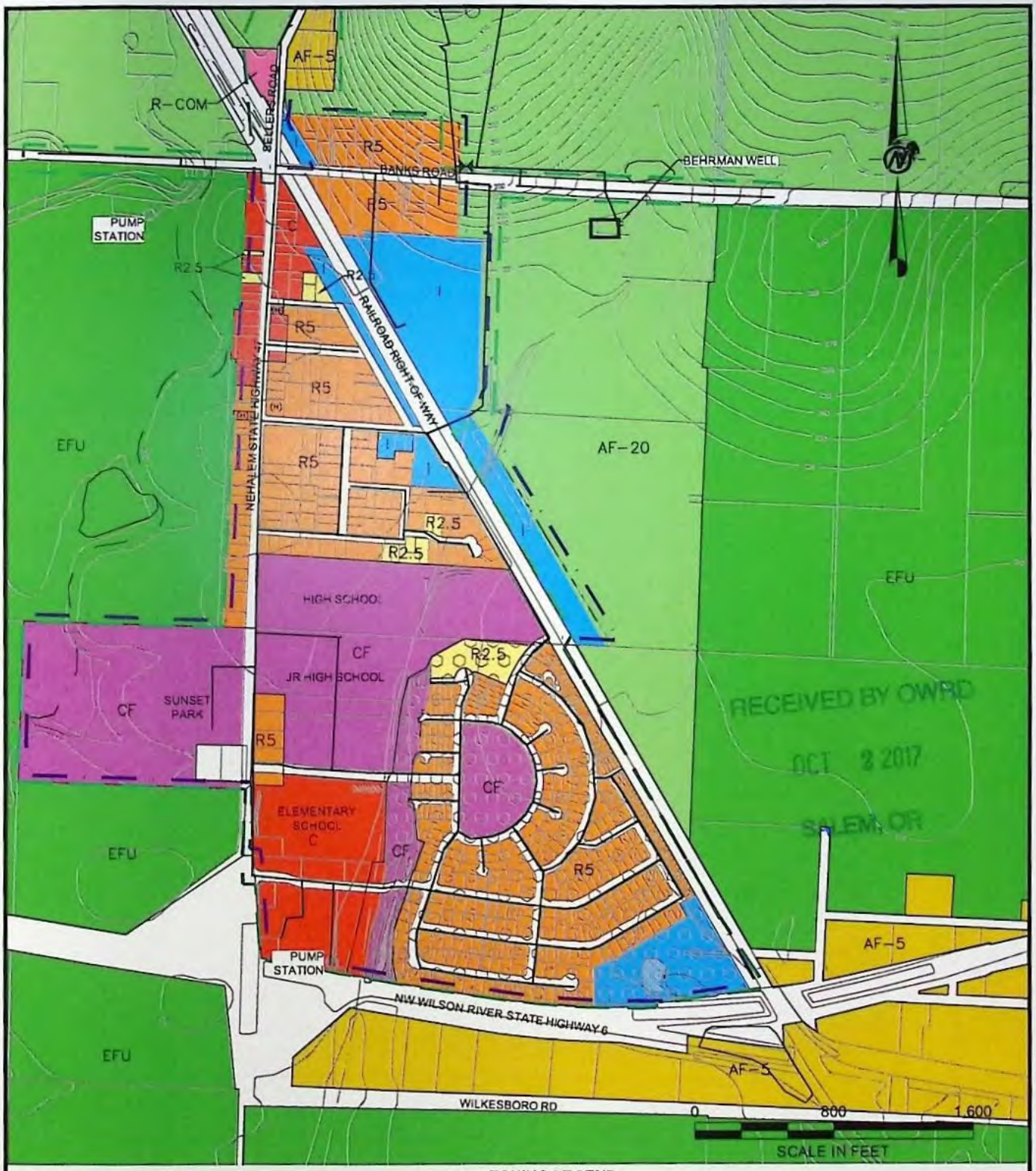
SALEM, OR

REFERENCE:
BUXTON, OREGON 1979; REVISED 1992
MEACHAM CORNER, OREGON 1979; REVISED 1992

FIGURE **2-3**

SPRING RECHARGE AREA

KJ|CITY OF BANKS WATER PLAN|OR (US) | WMCP-BANKS



GENERAL LEGEND

- STREAMS
- QUARTER SECTIONS
- TAX LOTS
- CITY LIMIT
- URBAN GROWTH BOUNDARY
- SERVICE AREA

ZONING LEGEND

CITY OF BANKS ZONING DISTRICTS

- SINGLE FAMILY RESIDENTIAL (R5)
- MULTI-FAMILY RESIDENTIAL (R2.5)
- COMMUNITY FACILITIES (CF)
- GENERAL COMMERCIAL (C)
- GENERAL INDUSTRIAL (I)
- (H) HISTORIC RESOURCE OVERLAY (H)
- PLANNED DEVELOPMENT (PD)

WASHINGTON COUNTY ZONING DISTRICTS

- EXCLUSIVE FARM USE (EFU)
- AGRICULTURE AND FOREST-20 (AF-20)
- AGRICULTURE AND FOREST-10 (AF-10)
- AGRICULTURE AND FOREST-5 (AF-5)
- RURAL RESIDENTIAL-5 (RR-5)
- RURAL COMMERCIAL (R-COM)

FIGURE **5-1**

PLANNED SERVICE AREA

KJ|CITY OF BANKS WATER PLAN|OR (US) | WMCP-BANKS

K:\CAD\Projects\2007\07399792\r2\0739979201-F2_F4r2.dwg | FIGURE 5-1 | Mod: 03/18/2009, 15:51 | Plotted: 03/18/2009, 15:53 | SSimmons

Golder Associates

FIGURE **5-2**

POTENTIAL FUTURE WELL

KJ|CITY OF BANKS WATER PLAN|OR (US) | WMCP-BANKS

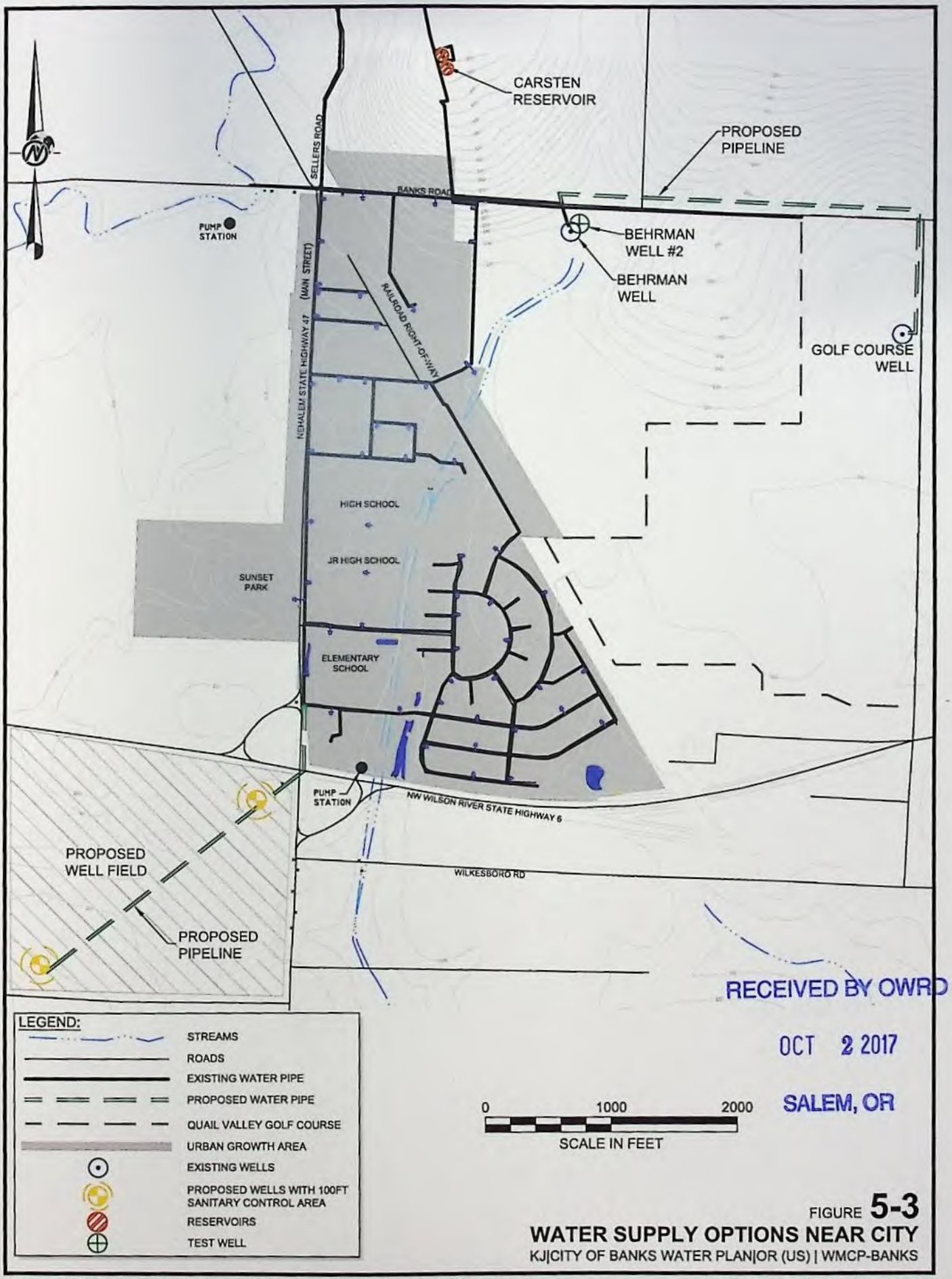


FIGURE **5-3**

WATER SUPPLY OPTIONS NEAR CITY

KJ|CITY OF BANKS WATER PLAN|OR (US) | WMCP-BANKS

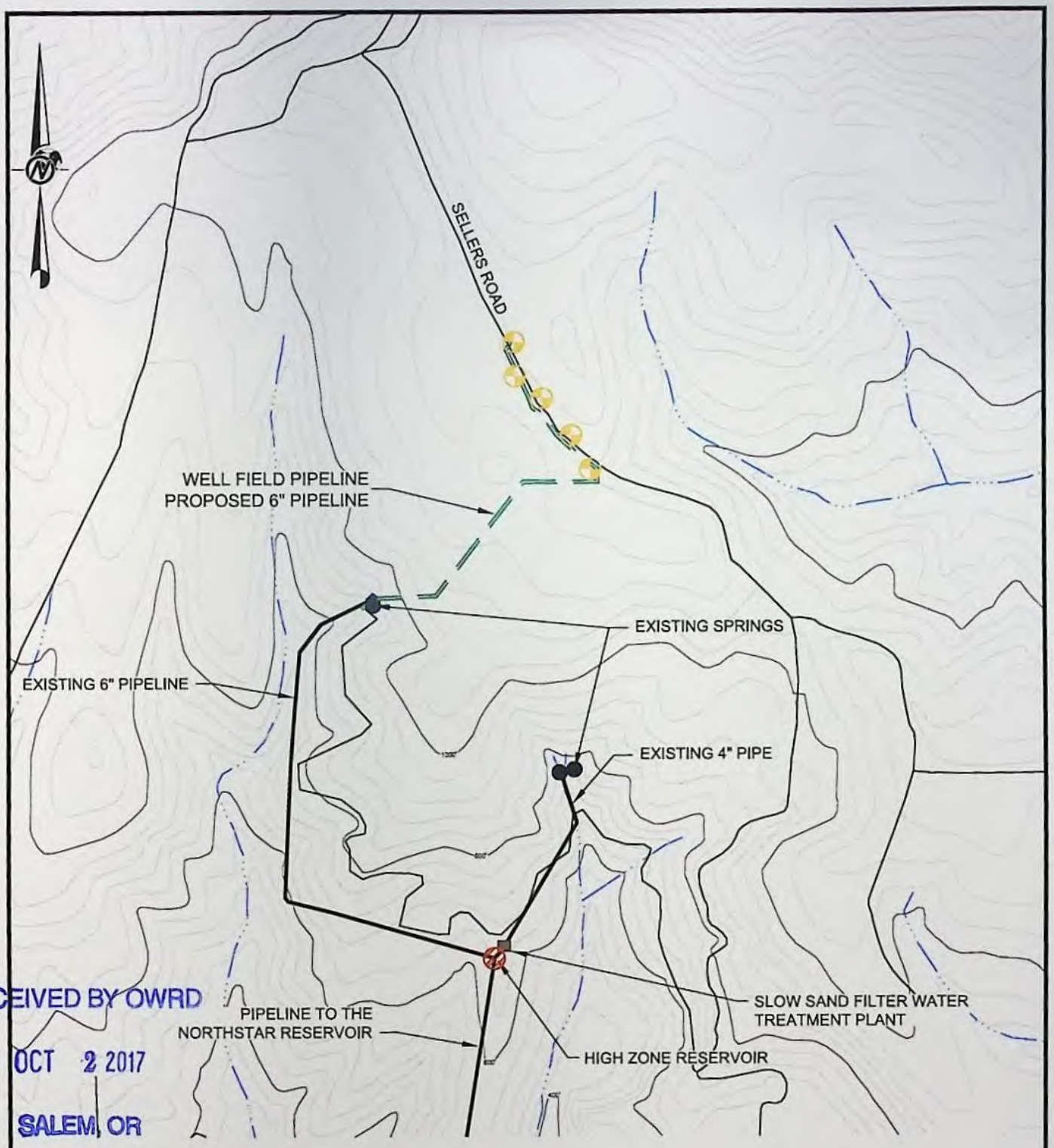


FIGURE **5-4**

WATER SUPPLY OPTIONS NORTH OF CITY

KJ|CITY OF BANKS WATER PLAN|OR (US) | WMCP-BANKS

ADDENDUM 1

Golder Associates

June 23, 2010 073-99792

Lisa Jaramillo
Oregon Water Resources Department
North Mall Office Building
725 Summer Street NE, Suite A
Salem, OR 97301-1266

RE: CITY OF BANKS WATER MANAGEMENT AND CONSERVATION PLAN

Dear Lisa:

The following is a response to your letter dated August 21, 2009 regarding the Oregon Water Resource Department's (OWRD, or the Department) comments on the proposed City of Banks Water Management and Conservation Plan (WMCP) submitted to the Department on April 17, 2009. Thank you for your comments and communications provided on this plan to date, and for the opportunity to respond to your letter.

The Department requested that the proposed WMCP establish five-year conservation benchmarks identifying the actions to which the City of Banks has committed, and the schedule proposed to carry out those conservation activities. Please consider this letter a supplement to the WMCP, providing responses to OWRD's comments and requests for additional information in the format provided in OWRD's comment letter of August 21, 2009.

OAR 690-086-0140 Water Supplier Description	
(3) An assessment of the adequacy and reliability of the existing water supply considering potential limitations on continued or expanded use under existing water rights resulting from existing and potential future restrictions on the community's water supply;	OWRD noted that although it is not a requirement, the City of Banks may consider placing its water right certificate (#83138) instream, either on a permanent or time-limited basis. As the City is not continuously utilizing this water right due to turbidity events, such a transfer may benefit restoration activities of stream flows in the area. However, it is not clear that this spring directly contributes surface flows **to** another down gradient stream or river. The City of Banks is interested in supporting OWRD's Flow Restoration Program, and will follow up with the Department to further discuss this option.
(4) A quantification of the water delivered by the water supplier that identifies current and available historic annual water use, peak seasonal use, and average and peak day use;	Table 2-2 (page 4) of the proposed WMCP listed current and historic use data for the City of Banks; however, average annual water use was not included. Based on the average day demand over the years 2005-2007, and the respective total service population for each of those years, annual water use in million gallons per year (mgy) in the City of Banks

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Lake Oswego, OR 97035 USA
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	was approximately 94.4 mgy (2005); 98.4 mgy (2006); and 97.2 mgy (2007).
(5) A tabular list of water rights held by the municipal water supplier that includes the following information: (c) Source(s) of water;	Please see Attachment A The source for Certificate 83138 is listed in the WMCP as "Spring (Small Springs)." The Certificate identifies the source as "Two Unnamed Streams." This discrepancy is entirely a semantic one; the two Small Springs are the source for the Two Unnamed Streams which run from the spring sources to a diversion structure within 20 to approximately 200 feet of their origin. Each spring has its own small diversion dam which captures the flow from the springs. The age of the diversion structures is not known but is reported as part of the original 1920s water supply project. The discharge from the springs is trapped behind each diversion structure and conjoined into one pipe for conveyance to the filter plant gallery where the meter is located. Neither the Small Springs nor Two Unnamed Springs would contribute to flows down stream when 100% utilized under the water right. Records provided to OWRD indicate that the City uses this source intermittently from year to year. Under Cert. 83138 the two diversions are measured together, as two smaller separate pipelines for each is considered impractical. The water use is reported to OWRD under either Report ID 11173 or 11174 by the City for Cert. 83138. The locations of the spring origins and diversion structures have very difficult access on steep slopes and slippery trails. This health and safety concern limits regular access to the diversion structures.
(5) A tabular list of water rights held by the municipal water supplier that includes the following information: (f) Maximum instantaneous and annual quantity of water diverted under each right to date;	Please see Attachment A. Table 2-3 (page 5) of the proposed WMCP lists maximum instantaneous use to date from each water right held by the City of Banks; Attachment A supplements this information with the Maximum instantaneous and annual quantity of water diverted under each right to date. For more information, please see the City's

	annual water use reporting data, submitted pursuant to OAR 690, Chapter 85.
(5) A tabular list of water rights held by the municipal water supplier that includes the following information: (g) Average monthly and daily diversions under each right for the previous year; and if available for the previous five years;	Please see Attachment B for the requested information.
(5) A tabular list of water rights held by the municipal water supplier that includes the following information: (h) Currently authorized date for completion of development under each right; and	Table 2-3 (page 5) of the WMCP contains a typographical error. The authorized date for completion of construction and development under application S-8476 (Permit G-7593) is acknowledged to be October 1, 2017. This correction is made in Attachment A.
(5) A tabular list of water rights held by the municipal water supplier that includes the following information: (i) Identification of any streamflow-dependent species listed by a state of federal agency as sensitive, threatened or endangered that are present in the source, any listing of the source as water quality limited and the water quality parameters for which the source was listed, and any designation of the source as being in a critical ground water area.	In general only the two surface water Certificates (83138 and 5353) have the potential to affect water quality of the Tualatin Sub-basin, specifically the West Fork of Dairy Creek. Both Certificate diversions are isolated and generally capture 100% of the stream/spring flow when they are in use. Because the diversion structures capture the flow within 20 to 200 feet of the spring source, there are no known listed species in this initial reach of the stream/spring system which is located in the mountainous area of the northern Tualatin Basin. The diversion structures are not designed for fish passage and these high reaches are not known to harbor any listed species. The stream channels immediately below the diversion structures are filled with soil and rock for access roads and in some cases revegatated because the former streambed is used so infrequently. Regular drainage from upland areas surrounding the springs are captured in road side ditches and directed to small under-road culverts. Because of the isolation of these sources and the generally good water quality, a tabular listing of water quality limitations is not applicable to these springs. Downstream reaches in Dairy Creek, the Tualatin River and Willamette River do have water quality limitations but a tabulation of those limitations and threatened and endangered species associated with larger water sources downstream is not warranted for these certificated water rights. The tabular list for the

	water rights, water quality limitations, and listed species is presented in Attachment D. When the diversions are not in use or when some excess water flows from the springs, typically during wet winter months, the excess water spills over the top of the diversion structures and moves as overland flow and subsurface flow along topographic lows, and eventually discharges to an unnamed tributary of Dairy Creek. This contributes to the winter flow of Dairy Creek, which flows to the Tualatin River and on to the Willamette River. The waters of Dairy Creek, the Tualatin River and Willamette River have several listed species. In the Upper Willamette River Steelhead (*Onocorhynchus mykiss*) and Chinook Salmon (*Onocorhynchus tshawytscha*) are listed as Threatened under the federal Environmental Species Act.
(6) A description of customers served including other water suppliers and the estimated numbers; general water use characteristics of residences, commercial and industrial facilities, and any other uses; and a comparison of quantities of water used in each sector with the quantities reported in the water supplier's previously submitted water management and conservation plan and progress reports; RECEIVED BY OWRD OCT 2 2017 SALEM, OR	The City has not submitted a WMCP or progress report since 2001. The 2001 plan did contained eight categories of estimated water consumers. The City no longer tracks use in eight categories and has revised the water use into three categories that are tracked with some accuracy. Please also refer to Attachment C. There are three Categories of water customers in Banks. 1. **Commercial/Industrial** 2. **Residential** 3. **Bulk Water** Please refer to Attachment C, which presents the water use patterns of these three customer sectors. In general, commercial/industrial use has declined and residential use has increased over the record of use from 2006 to 2009. The overall customer metered water use has declined by 13.8 percent over this period.
OAR 690-086-0150 Water Conservation Element	
(2) A description of the water supplier's water use measurement and reporting program and a statement that the program complies with the measurement standards in OAR Chapter	The City of Banks meters and reports all source water diverted from each water source per OAR Chapter 690, Division 85. The water rights for each water source are metered

690, Division 85, that a time extension or waiver has been granted, or that the standards are not applicable;	individually.
(4) A description of the specific activities, along with a schedule that establishes five-year benchmarks, for implementation of each of the following conservation measures that are required of all municipal water suppliers: (a) An annual water audit that includes a systematic and documented methodology for estimating any unmetered authorized and unauthorized uses;	As stated in the proposed WMCP, the City's annual water use audit is currently under development (in the data input stage). Implementation of an annual water audit will begin within the next five years (no later than 2014). The proposed water audit software is systematic and will provide documented methods for estimating authorized and unauthorized use through AWWA software. The City will maintain this database monthly for comparison with measured water diversions. The City has also instituted a program for assessing leaks across the entire system. The leak detection survey will be completed every five years. The first survey was completed August 12, 2009. The survey identified system and customer leaks for prioritization and repair. The next scheduled survey is for 2014.
(4) A description of the specific activities, along with a schedule that establishes five-year benchmarks, for implementation of each of the following conservation measures that are required of all municipal water suppliers: (c) A meter testing and maintenance program; RECEIVED BY OWRD OCT 2 2017 SALEM, OR	The City currently conducts meter tests on its customer meters in accordance with AWWA standards of practice (manual M6, 4th edition, 1999), at the time of installation and if meter records subsequently suggest drifting. Supply meters will accordingly be tested on a regular basis following AWWA guidelines and manufacture's recommendations. The City will develop its supply meter testing program and begin implementing the program within five years (not later than the end of 2014). Currently monthly inspection is completed by the City Water System Operator during the meter reading rounds. This will continue. The City has also instituted a meter change-out program that will take 5 years to complete. After that all meters will be changed on a 10 year cycle.
(4) A description of the specific activities, along with a schedule that establishes five-year benchmarks, for implementation of each of the following conservation measures that are required of all municipal water suppliers: (e) If the annual water audit indicates that system leakage exceeds 10 percent, a	The AWWA water audit software proposed in the City's WMCP is systematic and may provide documented methods for estimating authorized and unauthorized water use. The City will continue to review the AWWA software as a potential auditing program component, along with other options to enable

regularly scheduled and systematic program to detect leaks in the transmission and distribution system using methods and technology appropriate to the size and capabilities of the municipal water supplier; and	the City to develop a Water Use Audit Program. The Program will serve as a leak detection program, estimating system leakage on an annual basis. Identification of consistent leakage exceeding 10 percent from year to year will enable the City to respond with a systematic review of water use and distribution infrastructure condition. The Program will also be of assistance in tracking the effectiveness of City measures implemented to reduce leakage in its water system. Implementation of an annual Water Use Audit Program will begin in within the next five years (no later than November 30, 2014), and will incorporate review and action-implementation strategies to reduce water loss. The City has also implemented a direct leak detection survey on a regular 5-year schedule. The initial leak survey was competed August 12, 2009.
(4) A description of the specific activities, along with a schedule that establishes five-year benchmarks, for implementation of each of the following conservation measures that are required of all municipal water suppliers: (f) A public education program to encourage efficient water use and the use of low water use landscaping that includes regular communication of the supplier's water conservation activities and schedule to customers; RECEIVED BY OWRD OCT 2 2017 SALEM, OR	Golder Associates Inc. and Kennedy/Jenks Consultants Inc. developed an informational pamphlet on water conservation measures, and presented a water conservation workshop to the City at a public meeting in the first quarter of 2009. The Water Conservation Pamphlet is available to the public and is on display at the City Offices. The City does not propose a regular schedule for delivering special alerts with its water bills, but rather will distribute notices as needed based on a review of seasonal water supply and use conditions and following the annual water audit review. The City has implement a program that delivers semi-annual educational messages and water conservation tips with water bills, updating water customers on the City's conservation activities and customer conservation options including messages on efficient water use and the use of low water demand landscaping. The tips originate from an AWWA water conservation education program. The City maintains historical documentation of educational messages and

	water conservation tips delivered to customers.
OAR 690-086-0170 Municipal Water Supply Element	
(5) If any expansion or initial diversion of water allocated under existing permits is necessary to meet the needs shown in section (3) of this rule, an analysis of alternative sources of water that considers availability, reliability, feasibility and likely environmental impacts. The analysis shall consider the extent to which the projected water needs can be satisfied through: (b) Interconnection with other municipal supply systems and cooperative regional water management; and	There are no existing water supply interconnections with other municipal sources or regional cooperative water management agencies that provide available, reliable, and known feasible solutions for alternative water sources that would not require additional planning, design, and construction. All options for additional water involve increased summer diversions from the Tualatin River subbasin surface water or from storage at Scoggins Reservoir; generally both options potentially reduce surface water availability to flow-dependant listed species in the Tualatin subbasin. The options proposed have been evaluated in terms of cost in the City's 2009 Water Master Plan. OWRD has specifically requested additional information regarding feasibility of the following alternative sources: 1) Section 5.6.2.2 Purchase of non-potable water from Tualatin Valley Irrigation District (TVID) in order to supply large-volume water customers with an alternative source of non-potable irrigation water. This option refers to an evaluation for building an intertie with TVID. However, TVID would have to conduct its own feasibility study and supply analysis, which would cost the City approximately $35,000. The driver for this idea was to off load the School District irrigation water use from the City's drinking water supply. Subsequent investigation found that the School District did not use City drinking water for irrigation, but had its own groundwater source. Therefore there would be no cost or environmental benefit for the TVID intertie. 2) Section 5.6.2.2 Developing an intertie with the closest city, Forest Grove, would involve negotiating an agreement for Forest Grove water or purchasing water wheeled through the Forest Grove system from Tualatin Valley Water District (TVWD) or Joint Water Commission. Both options would involve the construction of a 5.3-mile pipeline from Banks

	to Forest Grove. The 2001 cost estimate for that work was $3.2 million. This cost is still considered non-feasible by the City council and is not required based on the available groundwater right permits held by the City. Utilization of Forest Grove's water rights would directly impact the live summer flows on the Tualatin. The purchase from TVWD might depend on a dam raise or reconstruction of Scoggin's Reservoir, a project with uncertain feasibility. The environmental benefits of both options are considered neutral because each alternative source has a direct impact on the Tualatin River. The development of the groundwater rights held by the City provides the least impact alternative for enhancing the City's water supply and adding redundancy to the system with the incorporation of an existing, improved second well.

The City of Banks is committed to water conservation, and is pleased to work with the Department's Field Services Division to satisfy OWRD regulations regarding water management and conservation planning. We hope you will find this Water Management and Conservation Plan Supplement sufficient to answer your requests for additional information.

Sincerely,

GOLDER ASSOCIATES INC.

Bob Long, Jr., RG, CWRE
Associate Senior Consultant

Kara Warner
Environmental Scientist

cc: Darrell Hedin, District 18 Watermaster, OWRD
James Hough, City of Banks City Administrator, 120 S. Main Street, Banks, OR 97106
Fred Evers, City of Banks Public Works Supervisor, 120 S. Main Street, Banks, OR 97106
Gordon Munro, Kennedy/Jenks Consultants, 200 SW Market St., Ste 500, Portland, OR 97201

Encl: Attachment A: Maximum Instantaneous Rate and Annual Quantity
Attachment B: Metered Water Use per Water Right
Attachment C: Consumed Water Metered to Customers by Market Sector
Attachment D: Tabular List Stream Flow Dependant Species and Water Quality Limitations

ATTACHMENTS

Attachment A
OAR 690-086-0140 (5)(a)(b)(c)(d)(e)(f)(h)

City of Banks
Water Management and Conservation Plan; Supplement
OAR 690-086-0140 (5) (a)(b)(c)(d)(e)(f)(h) Maximum Instantaneous and Annual Rate

Report ID	Application	Permit	Certificate	Transfer	Sources of Water	Priority Date	Completion Date	Types of Beneficial Uses	Maximum Instantaneous Rate Allowed (cfs)	Maximum Annual Quantity Allowed (mcf)	Maximum Instantaneous Rate to Date (cfs)	Maximum Annual Quantity to Date	Comments
11173	S-65611	S-48173	83138		Unnamed Str. (Small spg.)	25-Aug-1983	Complete	Municipal					The maximum reported annual total (9.10) is from a 2002 data sheet. This maximum seems unlikely for this source and is probably a transcription error. This total is likely for Cert. 5353 in 2002. We note that Cert. 5353 has no flow reported for 2002 on the OWRD database. The totals reported in 2009 for Cert. 83138 are Annual Max. of 4.20 mcf and average daily rate of 0.13 cfs. The total of 4.20 mcf is a more defensible Maximum Annual Quantity . No daily data were available.
11174	S-65611	S-48173	83138		Unnamed Str. (Small spg.)	25-Aug-1983	Complete	Municipal	0.18	5.68	0.18	9.10	
11175	G-8476	G-7593		T-10055	Well 1 (Behrman Well)	29-Sep-1977	17-Oct-2017	Municipal	0.67	21.13	0.61	6.37	Maximum total from 2001
11176	S-9207	S-6516	5353		Large Spring	3-Oct-1923	Complete	Municipal	0.42	13.25	0.42	9.24	Maximum total from 2003
62979	G-15887	G-16312			Well 2	5-Dec-2002	28-Apr-2028	Municipal	1.00	31.54	0.00	0.00	Under development

Notes: cfs -Cubic Feet Per Second
mcf- Million Cubic Feet
Likely Error See comments for discussion and clarification.

Attachment B
OAR 690-086-0140 (5)(g)

City of Banks
Water Management and Conservation Plan; Supplement
OAR 690-086-0140 (5)(g) Water Use per Water Right

Report ID	Application	Permit	Certificate	Transfer	Sources of Water	Average Monthly Diversion-Gallons 2009	Average Monthly Diversion-Gallons 2008	Average Monthly Diversion-Gallons 2007	Average Monthly Diversion-Gallons 2006	Average Monthly Diversion-Gallons 2005	Average Daily Diversion-Gallons 2009	Average Daily Diversion-Gallons 2008	Average Daily Diversion-Gallons 2007	Average Daily Diversion-Gallons 2006	Average Daily Diversion-Gallons 2005
11173 11174	S-65611 S-65611	S-48173 S-48173	83138 83138		Unnamed Str. (Small spg.) Unnamed Str. (Small spg.)	2,619,517	0	0	0	0	86,121	0	0	0	0
11175	G-8476	G-7593		T-10055	Well 1 (Behrman Well)	3,039,650	2,552,317	2,482,367	2,921,833	3,310,992	99,934	83,912	81,612	96,060	108,855
11176	S-9207	S-6516	5353		Large Spring	2,319,612	4,848,058	5,536,908	5,050,550	3,557,608	76,261	159,388	182,035	166,045	116,962
62979	G-15887	G-16312			Well 2	0	0	0	0	0	0	0	0	0	0

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Attachment C
OAR 690-086-0140 (6)

City of Banks
Water Management and Conservation Plan: Supplement
OAR 690-086-0140 (6) Metered Water Use by Market Sector

Consumed Water Metered to Customers in Cubic Feet (CF)

	2006	2007	2008	2009	Commments
Commercial/Industrial	3,205,934	2,652,931	1,636,487	1,228,595	Includes: School District -6 connections, Saw mill- 1 connection, and approx. 5-resturants.
Residential Use	6,720,214	6,563,956	7,203,880	7,468,367	1740 residents
Bulk Water	339,750	204,700	319,300	145,450	Construction, street cleaning and other city use
Total Metered (CF)	10,265,898	9,421,587	9,159,667	8,842,412	

City of Banks
Water Management and Conservation Plan; Supplement
OAR 690-086-0140 (5) (i) Stream Flow Dependant Species and Water Quality Limitations

OWRD Source Report ID	Application	Permit	Certificate	Transfer	Sources of Water	Stream Flow Dependant State and Federal Listed Species	Water Quality Listed	Types of Beneficial Uses
11173	S-65611	S-48173	83138		Unnamed Str. (Small spring)	In the West Fork of Dairy Creek-Steelhead (*Onocorhynchus mykiss*) is listed as Threatened under the federal Environmental Species Act.	Not limited in this upper reach above the West Fork of Dairy Creek.	Municipal
11174	S-65611	S-48173	83138		Unnamed Str. (Small spring)	In the West Fork of Dairy Creek-Steelhead (*Onocorhynchus mykiss*) is listed as Threatened under the federal Environmental Species Act.	Not limited in this upper reach above the West Fork of Dairy Creek.	Municipal
11175	G-8476	G-7593		T-10055	Well 1 (Behrman Well)	Not Applicable		Municipal
11176	S-9207	S-6516	5353		Large spring	In the West Fork of Dairy Creek-Steelhead (*Onocorhynchus mykiss*) is listed as Threatened under the federal Environmental Species Act.	Not limited in this upper reach above the West Fork of Dairy Creek.	Municipal
62979	G-15887	G-16312			Well 2	Not Applicable		Municipal

ADDENDUM 2

From: Long, Robert
Sent: Thursday, July 15, 2010 4:02 PM
To: Lisa Jaramillo
Cc: J. A. Hough (citymanager@cityofbanks.org); Gordon Munro
Subject: Second Amendment to City of Banks WCMP

Dear Lisa,

This second addendum to the City of Banks Water Management and Conservation Plan (WMCP) dated April 7, 2009 is meant to clarify a request for additional "green light" water. In the WCMP the City of Banks requests additional greenlight water for both its groundwater rights. The request for additional greenlight water is pertinent only to G- 7593. It is our current understanding that greenlight water is not required for water appropriated under groundwater permit G-16312. Permit G-16312 is a newer water right with a 20-year development period that ends April 28th 2028, at which time the ground water well must be fully developed. The City is not restricted from developing this permit to its full potential of 1.0 cfs during this time period and up until the completion date of April 28th 2028. Please amend the Banks WMCP to address this issue and approve the additional greenlight water for G-7593.

Based on our conversation it is my understanding that the draft of the Final Order will be provided for the City to review before the Final Order is issued by OWRD. We look forward to reviewing that draft in the next few weeks.

Best Regards- BL

Bob Long | Associate and Senior Consultant| **Golder Associates Inc.**
9 Monroe Parkway, Suite 270, Lake Oswego, Oregon, USA 97035
T: +1 (503) 607-1820 | **F:** +1 (503) 607-1825 | **E:** blong@golder.com | **www.golder.com**

Oregon
Theodore R. Kulongoski, Governor

Water Resources Department
North Mall Office Building
725 Summer Street NE, Suite A
Salem, OR 97301-1271
503-986-0900
FAX 503-986-0904

August 11, 2010

City of Banks
Attn: Fred Evers, Public Works Supervisor
120 S. Main
Banks, OR 97106

Subject: Water Management and Conservation Plan

Dear Mr. Evers:

Thank you for your response to my review of your water management and conservation plan (plan) and submittal of revisions to your plan.

The Department has reviewed the revised plan and determined it to be generally consistent with the relevant requirements under OAR Chapter 690, Division 086. Therefore, please find the enclosed final order approving your water management and conservation plan and authorizing the diversion of up to 0.67 cfs of water under Permit G-7593.

We appreciate your cooperation in this effort. Please do not hesitate to contact me at 503-986-0880 or Lisa.J.Jaramillo@wrd.state.or.us if you have any questions.

Sincerely,

Lisa J. Jaramillo
Water Management and Conservation Analyst
Field Services Division

Enclosure

cc: WMCP File
Application G-8476 (Permit G-7593)
Darrell Hedin, District #18 Watermaster
Scott Kudlemeyer, Water Right Extensions
Golder Assoc., Inc., Attn: Bob Long, 9 Monroe Pkwy, Ste. 270, Lake Oswego, OR 97035
Kennedy/Jenks Consultants, 200 SW Market Street, Ste. 500 Portland, OR 97201
City of Banks, Attn: J.A. Hough, City Manager, 120 S. Main, Banks, OR 97106

BEFORE THE WATER RESOURCES DEPARTMENT
OF THE
STATE OF OREGON

In the Matter of the Proposed Water Management and Conservation Plan for City of Banks, Washington County	)))	FINAL ORDER APPROVING A WATER MANAGEMENT AND CONSERVATION PLAN

Authority

OAR Chapter 690, Division 086, establishes the process and criteria for approving water management and conservation plans required under the conditions of permits, permit extensions and other orders of the Department. An approved water management plan may authorize the diversion and use of water under a permit extended pursuant to OAR Chapter 690, Division 315.

Background

On April 17, 2009, the City of Banks submitted a draft Water Management and Conservation Plan for review under OAR Chapter 690, Division 086 (November 2002). Submittal of the plan was required under the Final Order approving an Extension of Time for Permit G-7593.

The Department published notice of receipt of the plan on April 21, 2009, as required under OAR Chapter 690, Division 086. No public comments were received.

The Department provided comments on the plan to the City on August 21, 2009, and, in response, the City submitted supplemental information revising the plan on June 28 and July 15, 2010.

Findings of Fact

1. The City of Banks Water Management and Conservation Plan contains all of the plan elements required under OAR 690-086-0125.

2. The projections of future water needs in the plan demonstrate a need for over 0.67 cfs of water available under Permit G-7593 to meet demands for the population anticipated in 20 years. These projections are reasonable and consistent with the City's land use plan.

3. The plan includes 5-year benchmarks for installation and maintenance of new water audit software, implementation of an annual water audit and a meter replacement program, as well as the continuation of customer meter testing, leak detection surveys and the semi-annual inclusion of educational messages and water conservation tips on water bills. The system is fully metered and the rate structure includes a base rate and volumetric charge. Unaccounted for water is estimated at 29.5 percent.

4. The plan includes 5-year benchmarks for the evaluation, development, and implementation of a program to regularly test the City's supply meters.

This final order is subject to judicial review by the Court of Appeals under ORS 183.482. Any petition for judicial review must be filed within the 60-day time period specified by ORS 183.482(1). Pursuant to ORS 536.075 and OAR 137-003-0675, you may petition for judicial review or petition the Director for reconsideration of this order. A petition for reconsideration may be granted or denied by the Director, and if no action is taken within 60 days following the date the petition was filed, the petition shall be deemed denied.

5. The plan identifies unnamed surface water springs and streams in the West Fork Dairy Creek subbasin and ground water (all within the Tualatin River Basin) as the sources of the City's water rights. The plan also accurately and completely describes the federally listed Upper Willamette River Steelhead and Chinook Salmon as threatened species, and identifies water quality issues in Dairy Creek, the Tualatin River and the Willamette River downstream of the City's source water.

6. The water curtailment element included in the plan satisfactorily promotes water curtailment practices and includes a list of three stages of alert with concurrent curtailment actions.

7. The diversion of water under permit G-7593 will be expanded during the next 20 years and is consistent with OAR 690-086-0130(7), as follows:

   a. As evidenced by the 5-year benchmarks described in Findings of Fact #3 and #4, the plan includes a schedule for development of conservation measures that would provide water at a cost that is equal to or lower than the cost of other identified sources;

   b. Considering fiscal limitations that, at this time, make it impractical for the City to install infrastructure necessary to purchase and convey additional water from other entities and considering limitations in the City's available supply from their surface water sources due to high turbidity levels in the winter and limited summer flow rates, increased use from the City's ground water source is the most feasible and appropriate water supply alternative to the supplier; and

   c. The City is not required to provide mitigation to address limitations or restrictions on the development of their ground water permits, as no resource issues pertaining to those permits have been identified under OAR 690-086-0140(5)(i).

Conclusion of Law

The water management and conservation plan submitted by the City of Banks is consistent with the criteria in OAR Chapter 690, Division 086.

Now, therefore, it is ORDERED:

1. The City of Banks Water Management and Conservation Plan is approved and shall remain in effect until August 9, 2020, unless this approval is rescinded pursuant to OAR 690-086-0920.

2. The limitation of the diversion of water under Permit G-7593 established by the Extension of Time approved on November 20, 2008, is removed and, subject to other limitations or conditions of the permit, the City of Banks is authorized to divert up to 0.67 cfs under Permit G-7593.

3. The City of Banks shall submit an updated plan within 10 years and no later than August 9, 2020.

4. The City of Banks shall submit a progress report containing the information required under OAR 690-086-0120(4) by August 9, 2015.

Dated at Salem, Oregon this 10 day of August, 2010.

Phillip C. Ward, Director

Mailing date: AUG 11 2010

Global Issues

At GOLDER ASSOCIATES, we strive to be the most respected global group specializing in ground engineering and environmental services. Employee owned since our formation in 1960, we have created a unique culture with pride in ownership, resulting in long-term organizational stability. Golder professionals take the time to build an understanding of client needs and of the specific environments in which they operate. We continue to expand our technical capabilities and have experienced steady growth with employees who operate from offices located throughout Africa, Asia, Australasia, Europe, North America and South America.

Local Solutions

Worldwide

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27.11.254.4800

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852.2562.3658

Australasia
61.7.3721.5400

Canada
1.403.299.5600

Europe
44.1628.586.213

North America
1.800.275.3281

South America
55.21.3095.9500

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Golder Associates

Exhibit E: City of Banks Water System Master Plan

(143 pages)

Kennedy/Jenks Consultants

200 S.W. Market Street, Suite 500
Portland, Oregon 97201
503-295-4911
FAX: 503-295-4901

City of Banks
Water System Master Plan

24 June 2009

Amended

1 November 2011

Prepared for

City of Banks
100 S. Main Street
Banks, OR 97106

K/J Project No. 0791015.10

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Executive Summary

The purpose of this plan is to provide the City of Banks (City) with a comprehensive water master plan (WMP) for the future development of their water system. The plan includes a description of the existing water system, the planning criteria, a water system analysis, and a capital improvement plan.

Amendment #1

In April 2011 the City authorized Kennedy/Jenks Consultants (Kennedy/Jenks) to perform a more in-depth evaluation of the flow control in the water system starting at the springs and going through to the Carsten Reservoirs. This does not include raw water originating from the Behrman Well. The evaluation was accepted by the City and adopted as an amendment to the water master plan. It has been included as Appendix C. The study is referenced in certain locations in the water master plan in order to clarify the modifications that were made to the plan.

Section 1, Water System Description

This section contains a discussion of the existing water system in 2008.

Water Supply

The City of Banks owns three sources of water supply.

- The Large Green Mountain Springs can reliably supply 110 gallons per minute (gpm).
- The Small Green Mountain Springs can reliably supply 20 gpm, but this is high turbidity water and has not been used recently.
- The Behrman Well can reliably supply 230 gpm.

Well No. 2, a second well at the Behrman Well site, has been drilled and tested and is being evaluated for implementation as either a backup groundwater source or an additional water supply. Further testing of the well and its impact on the aquifer will conclude the available capacity.

Water Rights: Table ES-1 shows a summary of Banks' water rights.

Table ES-1: Summary of Water Rights Held by the City of Banks

Application Number	Permit Number	Certificate Number	Transfer Number	Priority Date	Type of Use	Source
S-9207	S-6516	5353	--	3-Oct-1923	Municipal	Spring (Large Spring)
S-65611	S-48173	83138	--	25-Aug-1983	Municipal	Spring (Small Springs)
G-8476	G-7593	--	T-10055	29-Sep-1977	Municipal	A well (Behrman Well)
G-15887	G-16312	--	--	5-Dec-2002	Municipal	A well (Well #2)

Application Number	Authorized Use	Max Use To Date	Average Daily Diversion			Authorized Date for Completion of Development
			2005	2006	2007	
	cfs	cfs	cfs	cfs	cfs	
S-9207	0.42	0.42	0.25	0.27	0.29	Certificated
S-65611	0.18	0.18	0	0	0	Certificated
G-8476	0.67	0.61	0.15	0.15	0.12	Pending Extension
G-15887	1.00	0.00	0	0	0	28-Apr-2028

Note: these water rights specify a maximum rate, and do not have an associated maximum duty.

Banks has water rights totaling 2.27 cubic feet per second (cfs), or 1,020 gpm.

Treatment

The City constructed a slow-sand filter treatment plant (SSFP) in 1997 to treat the raw water from the Green Mountain Springs supply. It has a capacity of 300 gpm. In 2002, a flocculating clarifier was constructed for the Small Green Mountain Spring to pre-treat the incoming flow before the slow-sand filter. It has a capacity of 80.8 gpm based on the water right of the Small Springs.

Water from both the surface and groundwater source is chlorinated for disinfection using gas.

Treated Water Storage

The City has four storage reservoirs for a total storage capacity of 1.79 million gallons (MG).

Table ES-2: Summary of Existing Water Storage Facilities and Pressure Zones

Name	Capacity (MG)	Pressure Zone(s) Served	Overflow Elevation (ft)	Maximum Service Elevation (ft)	Minimum Service Elevation (ft)	Service Pressure (Static) Range (psi)
High Zone Reservoir	0.22	N/A	666.4	N/A	N/A	N/A
North Star Reservoir	0.07	High	578	520	240	43 – 135
Carsten Reservoirs 1 & 2	1.50	Main	414.5	320	200	41 - 93

Notes:

N/A = Not Applicable

Distribution Pipelines, Service Areas, and Telemetry

The transmission and distribution system has approximately 55,470-feet of pipe that ranges from 2-inch to 14-inch. The pipe material includes ductile iron, poly-vinyl chloride, cast iron, steel, and asbestos cement.

There are two pressure zones. The High Zone serves customers between the SSFP and the pressure sustaining/reducing valve (PSV/PRV) on Sellers Road. The Main Zone serves the remainder of the customers, which are predominately in the City Limits.

The City's water system is controlled primarily by altitude valves, a PSV/PRV, and automatic pump start-up based on reservoir levels.

Flow Control (Amendment #1)

Flow through the facilities from the springs to the Carsten Reservoirs is by gravity. The design plans for the various facilities show flow control elements that were either never installed or taken out of service. Therefore, the flow from the springs through the treatment plant, clearwell, North Star Reservoir, upper pressure zone and into the Carsten Reservoirs is done by manually adjusting valves.

Section 2, Water Requirements

This section contains a discussion of the planning data used in developing population and water demand projections for the years 2008 to 2028. The results are shown in Table ES-3 below.

Table ES-3: Population, Demands, and Water Use Characteristics

Year	2008	2028
Population in UGB	1,875	3,739
Population Served outside the UGB	305	305
Potential population in UR	N/A	unknown
Per capita daily water use	152 gpcpd	152 gpcpd
Peaking factor from ADD to MDD	2.3	2.3
Average Day Demand (ADD)	184 gpm 265,000 gpd	428 gpm 620,000 gpd
Maximum Day Demand (MDD)	414 gpm 600,000 gpd	984 gpm 1.4 mgd
Average Water Loss	27%	

Currently the City of Banks is at buildout conditions with regard to its City Limits boundary (which is the same as its urban growth boundary [UGB]). Banks is in the process of expanding its UGB. The land to be added has not yet been determined, however the amount of land is intended to provide for a specified population increase at noted in Table ES-3. The City is also in the process identifying Urban Reserve Areas (URAs), but has not determined where or how large this may be.

There are three large-volume water users in Banks that use at least 2.0 MG of water per year: the Home Owners Association (HOA) at Arbor Park (irrigation), the Quail Hollow Apartments (residential), and the Banks Lumber Co. (industrial).

The fire flows used for Banks are 1,500 gpm for 2 hours for the High Zone (rural low-density residential) and 3,000 gpm for 3 hours for the Main Zone (commercial, industrial, or institutional developments) and 1,000 gpm for 2 hours for the residential area within the City limits..

A Water Management and Conservation Plan (WMCP) is being prepared concurrently. The results of that planning effort will expound upon how Banks can curtail its water use, institute conservational measures, and capture more source availability to meet the water requirements of its growing population and demands.

Section 3, System Analysis Criteria and Hydraulic Model

This section contains a discussion of the criteria used to evaluate the adequacy of the water system to provide for the existing and projected demands.

Source, Storage, and Pipeline

The source capacity is required to supply the MDD. Demand greater than the MDD are served from the reservoir storage.

The storage requirements are split into three components: peaking equalization (25 percent of the MDD), emergency (twice the ADD), and fire flow storage (described in the previous section).

The distribution pipeline network must be able to meet the MDD plus fire flows. The minimum pressure in the distribution system at all times is 20 psi. The maximum targeted water velocity in the distribution system is 10 feet per second (fps) during fire flow.

Hydraulic Model

H2ONet is the selected software program used to simulate the hydraulics of Banks' water system.

Section 4, Water System Analysis

This section contains a discussion of the evaluation performed regarding the various components of the water system and how they will meet existing and future buildout demands. The proposed capital improvement projects fall out of the recommendations made in the water system analysis.

Water Source and Supply

The minimum reliable water delivery rates of Banks permitted and certificated water supplies is a total of 340 gpm. The existing average MDD is 414 gpm, meaning that there is an existing deficiency of 74 gpm. At the build out condition there is a deficiency of 644 gpm.
The existing source facilities are in adequate condition.

Water Storage and Service Areas

Under current conditions, the High Pressure Zone can only rely on the 0.07 MG available in the North Star Reservoir, leaving a deficiency of 0.20 MG of storage. The North Star tank is in poor condition, and the high zone tank is in adequate condition.

The Main Pressure Zone has sufficient storage to meet existing needs, but as the community expands additional storage will be required. The existing tanks are in adequate condition.

Table ES-4: Summary of Future Water Storage Facilities and Pressure Zones

Name	Capacity (MG)	Pressure Zone(s) Served	Overflow Elevation (ft)	Maximum Service Elevation (ft)	Minimum Service Elevation (ft)	Service Pressure (Static) Range (psi)
High Zone Reservoir	0.22	High & Intermediate	666.4	520	240	63 – 133
New Reservoir	1.0	Main	UNK	UNK	UNK	UNK
Carsten Reservoirs 1 & 2	1.50	Main	414.5	320	200	41 - 93

Notes:

UNK = Unknown

Pipelines

The distribution system evaluation shows that the City has an adequate distribution system to serve the existing population, and it provides a good backbone to expand as the UGB expands.

The amount of water loss in the system is considered high enough that measures should be taken. It is assumed that much of the water loss comes from the 3-mile tar-wrapped steel treated water transmission pipeline from the North Star Reservoir to the City's distribution system.

Treatment and Disinfection

The SSFP is in good operating condition and contains adequate hydraulic capacity to treat flows within the aggregate water rights. The flocculation equipment installed in 2002 be used to treat the 20 gpm of water available from the Small Springs is not in operation.

Controls and Telemetry, Site Security, and Meter Reading

The Banks water system would benefit from enhancements that linked the activity at the SSFP, Carsten Reservoir site, and Behrman Well site to a central control center. A comprehensive telemetry system is recommended, with the new Public Works building being the point of operations.

Each component of the water system should be evaluated from a security and accessibility standpoint. Based on the evaluation, which is often in the form of a Vulnerability Assessment, additional site security measures should be taken which coincide with the level of protection desired.

Public Works staff manually reads all meters in the water system on a monthly basis. Therefore, the system would benefit from the installation of automatic meter reading (AMR) technology. Different levels of technology are available, and the selected method should be based on criteria such as cost, operator requirements, and desired level of automation of the system.

UGB Expansion

The existing distribution system will support expansion of the UGB in any and/or all directions under the growth projections provided. To the northeast where the ground elevation rises, a new pressure zone would likely be required.

Regardless of the direction of the expansion, the new areas should be served by a 12-inch major loop that tie into the existing 12 and 14-inch pipe. The rest of the distribution grid can likely be 8-inch (verify with modeling).

Flow Control (Amendment #1)

The flow control from the springs to the Carsten Reservoirs could be automated in order to provide a more reliable system with regard to chlorine contact time, and a more efficient system with regard to water use. This can be accomplished through the installation of a series of control valves located at the: clearwell outlet, clearwell inlet, Carsten Reservoirs and the Sellers Road PRV station.

Section 5, Regulatory Evaluation

This section contains a discussion of the regulatory requirements enforced on water distributors in the State of Oregon. The details and findings of a Sanitary Survey and a Tracer Study are also located in this section. In short, the City is in compliance with regulations.

Section 6, Capital Improvement Plan

This section contains the recommended Capital Improvements to the Banks water system over the next 20 years. The following Table ES-5 contains an overview of each Capital Improvement Project.

Either 1A or 1B will be constructed based upon the outcome of the hydrogeological evaluation that is now in progress. The total assumes 1A will be selected.

The improvements for additional source will need to be updated as more information is developed such as the exact location of the new wells, negotiations between owners and agencies, and the outcome of further hydrogeotechnical studies.

Items 7, 8 and 9 are optional.

Amendment #1

Table ES-5 is replaced by Table 2 in section 5 of Amendment #1 found in Appendix C.

Table ES-5: Summary of Capital Improvement Projects

Project	Description	Total Project Cost	Schedule	SDC Eligible Cost
1A –	Well No. 2 – Additional Source	$670,000	2009	$670,000
1B –	Well No. 2 – Backup Supply	$540,000	2009	$540,000
2 –	Transmission Pipeline Replacement	$2,750,000	2009 - 2010	$530,000
3 –	SSFP Site Upgrades, Creation of Intermediate Pressure Zone	$270,000	2010 - 2011	$0
4 –	BW Site Upgrades	$220,000	2012 - 2013	$0
5 –	1.0-MG Main Zone Reservoir	$2,200,000	By 2024	$2,200,000
6 –	Distribution System Looping and Upgrades	$620,000	2010-2024	$0
7 –	SCADA System Upgrades	$450,000	optional	$0
8 –	Automatic Meter Reading	$420,000	optional	$0
9 –	Security System Upgrades	$100,000	optional	$0
10 –	Leak Detection Survey	$10,000	2009	$0
11A	Quail Valley Golf Course Study	$40,000	2010	$40,000
	Design & Construction	$1,200,000	2011	$1,200,000
11B	Sellers Road Wellfield Study	$150,000	2011	$150,000
	Design & Construction	$2,400,000	2012	$2,400,000
11C	Southwest Well Field Study	$300,000	2013	$300,000
	Design & construction	$1,500,000	2014	$1,500,000
11D	Alternative Water Providers	$0	2010	$0
	CIP Total:	**$13,300,000**		**$8,990,000**

Section 7, Funding Sources

This section contains an overview of the standard funding agencies and programs available for public works infrastructure projects. Specific funding packages for projects would need to be developed as the City proceeds. It is suggested that the City start any funding process by calling for a "one stop" meeting with the State and Federal funding agencies.

Section 1: Water System Description

1.1 Purpose

The purpose of this plan is to provide the City of Banks (City) with a comprehensive water master plan (WMP) for the future development of their water system. This plan is comprised of six sections: Section 1 includes the purpose and scope of the plan and a description of the existing water system; Section 2 provides an analysis of existing water use, population projections, and future water use projections; Section 3 summarizes the water system planning criteria; Section 4 provides a hydraulic and capacity analysis of the existing and future water system; Section 5 contains a brief regulatory evaluation of the water system; Section 6 provides a detailed Capital Improvement Plan through 2028 that includes order-of-magnitude cost estimates; and Section 7 provides information on funding sources for reference purposes.

Banks has previously prepared a water system master plan in 1995 (Robert E. Meyer Consultants, 1995), with an update to that document in 1998 (Bookman-Edmonston, 1998). This 2009 comprehensive WMP will account for the changes made to the water system since the previous planning efforts and will serve as a stand-alone document. This document has been prepared in conjunction with a Water Management and Conservation Plan (WMCP), which will serve as an update to the most recent WMCP written in 2001.

1.2 Scope

The City of Banks owns and operates the potable water system that provides water to its residents, commercial and industrial facilities, and 305 patrons living outside city limits. The Public Works Department performs the daily maintenance and operations of the water system.

Kennedy/Jenks Consultants (Kennedy/Jenks) was commissioned by Banks to develop a master plan addressing the state of the current water system. Components of the water system that have been analyzed and discussed are the water supply sources, treatment facilities, storage facilities, and the distribution and transmission systems within Banks and outside city limits. Following a thorough analysis of the existing systems, alterations and improvements to the water system are recommended, and a capital improvement plan is provided.

Figure 1-1 shows the existing water system, city limits, contours, and property lines. Figure 1-2 provides a more detailed view of the City's existing distribution system, highlighting the city limits, which is identical to the urban growth boundary (UGB), and those facets of the water system that are either inside the UGB or in close proximity.

1.3 Water Supply

The City of Banks owns three sources of water supply: the Large Green Mountain Springs, the Small Green Mountain Springs, and the Behrman Well. The Green Mountain Springs, tributaries of the West Fork of Dairy Creek, are located approximately 4 miles north of the City. The City has owned approximately 117 acres of land surrounding the Green Mountain Springs as a water source protection measure since the 1930s and 1940s. The Oregon Health

Department prepared a draft delineation of the recharge area for the springs indicating infiltrated water contribution from approximately 1,000 acres surrounding the spring sites. The third source, the Behrman Well, is located south of Banks Road. The locations of the Green Mountain Spring water sources are shown on Figure 1-3. The City has no emergency intertie with any other water systems and no intergovernmental agreements pertaining to the water system. Beginning at the supply sources located North of Banks, Figure 1-4 provides a schematic representation of the hydraulic profile of the Banks water system.

Large Green Mountain Springs

The Large Springs have been the primary source of water for the City since the 1920s, and provides a minimum flowrate of 110 gallons per minute (gpm). The Crippen Intake Structure was built in 1997 to collect raw surface water from the Large Spring, creating an impoundment that reliably feeds the City's water system. Excess water spills over a v-notch weir and into a creek, remaining within the watershed. Raw water is conveyed by gravity through 4,000 feet of 6-inch-diameter ductile iron pipeline to the slow-sand filter treatment plant (SSFP), where it is treated and dispersed into the City's drinking water system. The City recently replaced the raw water transmission pipeline, substituting an aging 6-inch-diameter steel line with a 6-inch-diameter ductile iron pipeline in May of 2005.

Small Green Mountain Springs

The Small Springs are an extremely turbid water source with a minimum flowrate of 20 gpm. A diversion dam has been constructed to contain this water source. However, because the slow-sand filters are sensitive to high turbidity, these springs are not used on a sustained basis. Raw water collected in the small springs is conveyed by gravity through 1,500 feet of 4-inch-diameter PVC pipe to the SSFP for treatment and inclusion in the City's water system.

Behrman Well

The Behrman Well was drilled in the Columbia River Basalt and the well house was constructed in 1979. The pump installed within the production well has a design pump capacity of 250 gpm and consistently produces water at a flow rate of 230 gpm. However, the Behrman Well is allowed to operate by the water right permit at a peak pumping rate of 300 gpm. The depth of the well is 450 feet, with a well casing diameter and depth of 8 inches and 210 feet, respectively.

The well pump motor, piping and valves, chlorination equipment, and the control system are located in a secure facility on the south side of Banks Road, east of Sellers Road. The pump is controlled automatically by the City's telemetry system, which signals the pump to start when the water level in the Carsten Reservoirs is low, and to stop automatically at preset maximum water levels in the tanks. The chlorine disinfection system involves the injection of chlorine gas from 150-pound cylinders into the discharge piping from the well. The gas is injected under a vacuum and allowed to mix with the raw groundwater via its detention time in the discharge piping from the wellhead facilities to the Carsten Reservoir site.

Based on records kept by the City's Public Works Department, over the period from 2005 to 2007 the well drew an average of 91,100 gallons of groundwater into the City's system per day. Assuming the pump operates at 250 gpm (the capacity rating for the well pump), the pump

averaged 6 hours of operating time per day over the three year period. The pump withdraws considerably more water into the Banks water system in the summertime, drawing a maximum of 412,400 gallons in one day over the three year period.

Well No. 2

The City drilled and completed a second production well, Well No. 2, at the Behrman Well site in 2005. Well No. 2 has not been outfitted with pump and transmission infrastructure to develop the well as a supply source.

Well No. 2 needs to undergo further testing before it is permanently installed as a fixture in the City's water system. Once the new well is developed as a production source, it will function as either a backup or an additional water supply source. Testing conducted in November 2005 resulted in the determination that long-term water yield in Well No. 2 is available, but has a significant effect on the capacity of the aquifer. This in turn affects the available water from the Behrman Well. Further testing will define the extents to which the two Wells can be used concurrently for water production.

1.4 Water Rights

The City holds two certificated surface water rights providing for water diverted from the Green Mountain Springs and two permitted groundwater rights providing for appropriation from the Behrman Well and Well No. 2. A summary of the City's water rights and historical water use is provided below in Table 1-1.

The City's water sources do not contain listed species, are not water quality limited, and do not occur in a critical groundwater area. Diversion and appropriation of water from the City's existing sources does not present potential issues for species habitat or resource protection related concerns.

Table 1-1: Summary of Water Rights Held by the City of Banks

Application Number	Permit Number	Certificate Number	Transfer Number	Priority Date	Type of Use	Source
S-9207	S-6516	5353	--	3-Oct-1923	Municipal	Spring (Large Spring)
S-65611	S-48173	83138	--	25-Aug-1983	Municipal	Spring (Small Springs)
G-8476	G-7593	--	T-10055	29-Sep-1977	Municipal	A well (Behrman Well)
G-15887	G-16312	--	--	5-Dec-2002	Municipal	A well (Well No. 2)

Application Number	Authorized Use cfs	Max Use To Date cfs	Average Daily Diversion 2005 cfs	2006 cfs	2007 cfs	Authorized Date for Completion of Development
S-9207	0.42	0.42	0.25	0.27	0.29	Certificated
S-65611	0.18	0.18	0	0	0	Certificated
G-8476	0.67	0.61	0.15	0.15	0.12	Pending Extension
G-15887	1.00	0.00	0	0	0	28-Apr-2028

Note: these water rights specify a maximum rate, and do not have an associated maximum duty.

1.5 Water Treatment

The City constructed a water treatment plant in 1997 to treat the raw water from the Green Mountain Springs supply. The SSFP was built in order to comply with the Federal Surface Water Treatment Rule.

Slow Sand Filter Plant

The SSFP treats raw water from the Green Mountain Springs by filtration through a sand media, producing an effluent that meets drinking water standards. The plant consists of a sedimentation basin, two filter basins, and a filter gallery. Each filter basin has a surface area of 1,650 square feet. Flow into the SSFP is metered and monitored through a connection to the telemetry system, with both "East" and "West" Filter outflows being recorded daily. Compilation of the daily data for the years 2005 through 2007 shows that the SSFP produced an average daily flow of approximately 121 gpm. The maximum water surface elevation of the plant is at approximately elevation 673 feet.

The SSFP was initially designed to treat incoming flows up to 100 gpm per filter, based on the inserts of the effluent flow control valves. The 1998 Water System Master Plan Update indicated that if the inserts to the valves were changed, a higher flowrate of incoming water could be treated without compromising water quality. The filter basins are now able to treat 150 gpm each, resulting in a total capacity of 300 gpm.

A flocculation/clarification facility was built in conjunction with upgrades to the SSFP pipe gallery in 2002 in order to provide pretreatment for the water collected from the small springs. The system involves chemical addition to the small springs flow stream, where it is piped through the flocculation treatment facility, into the sedimentation basin, with final treatment joining the large spring's water in the filter basins. The flocculation equipment was sized to treat the flowrates of the two small springs, and designed to be used during wet-weather periods when the small springs' source water experiences high levels of turbidity (WMCP, 2001).

The treated plant effluent flows by gravity into the 220,000 gallon steel reservoir, the High Zone Reservoir, located adjacent to and south of the SSFP. From there, treated water flows due South by gravity through a 6-inch-diameter PVC transmission main to the North Star Reservoir.

Disinfection

Water from both the surface and groundwater source is chlorinated for disinfection and to maintain a disinfection residual within the distribution system. The water withdrawn from the Green Mountain Springs receives chlorine gas injection just upstream of North Star Reservoir and the Behrman Well receives injection in the wellhead facilities building. Currently, the North Star Reservoir, with a storage capacity of 70,000 gallons, serves as a Clear Well to allow for chlorine contact time for the surface water sources. The 1998 Water System Master Plan Update indicated that the gaseous chlorination equipment at the North Star Reservoir Site is at the end of its useful life, and recommended new disinfection equipment be installed at the SSFP site. The groundwater pumping source uses the 6-inch-diameter discharge pipe for chlorine contact time before the water is distributed to the first customer.

1.6 Water Storage Facilities

The City of Banks has three water storage facilities: the High Zone Reservoir located at the SSFP; the North Star Reservoir; and Carsten Reservoirs No. 1 and 2. The three storage facilities are described below.

High Zone Reservoir

The reservoir located just downhill (to the southwest) of the SSFP is a 220,000 gallon (0.22-MG) bolted steel tank that receives treated water from the SSFP. The tank measures 25 feet in diameter, has a finished floor elevation of 650.4 feet, and an overflow elevation of 666.4 feet. It was built in 2002 along with the treatment plant additions discussed to provide extra storage and higher operating system pressure for supplying water to the high-zone customers. Also, the high zone reservoir was constructed as a clear well to allow for the relocation of the chlorine injection facilities to immediately downstream of the SSFP and to provide chlorine contact time, resulting in consolidated storage and treatment.

The High Zone Reservoir is in good condition, with no known history of leaks. However, the reservoir is not being used as it was intended. The 1998 Water System Master Plan Update proposed construction of the reservoir in conjunction with a sodium hypochlorite building at the SSFP site. This would result in onsite hypochlorite generation, and the ability to disinfect the treated surface water with a proven and safe disinfection system. Having a clear well at the treatment plant site would allow for the eradication of the North Star Reservoir and the consolidation of the filtration and disinfection of the water being treated from the Green Mountain Springs.

North Star Reservoir

The 70,000-gallon (0.07-MG) North Star Reservoir is a circular, reinforced-concrete tank measuring 30 feet in diameter with a 14-foot side water depth. This tank was built in 1981 to store accumulated flow for the Green Mountain Springs. The floor of the tank is at elevation 564 with an overflow elevation of 578 feet. The North Star Reservoir currently serves as a contact chamber for chlorine injection and disinfection.

A Tracer Study was recently completed that concluded the amount of chlorine contact time between water entering the North Star Reservoir until water reached the first customer was sufficient but borderline. This, coupled with the need for all water to travel through North Star for disinfection purposes (thereby not utilizing the storage capacity of the High Zone Reservoir), does not allow for the system to operate most efficiently. Therefore, as the North Star Reservoir is currently experiencing visible deterioration, it should be taken offline and abandoned. The High Zone Reservoir would then doubly serve as both a clear well for disinfection and storage volume for the High Zone (see Section 4).

Carsten Reservoirs No. 1 and No. 2

The 500,000-gallon (0.50-MG) Carsten Reservoir No. 1 is a circular, welded-steel tank measuring 60 feet in diameter with a 24-foot side water depth. This tank was constructed in 1993 and accumulates water from both the North Star Reservoir and the Behrman Well. The finished floor elevation is at 390 feet with an overflow elevation of 414 feet. The Carsten Reservoir No.1 is the northern tank at the Carsten Reservoir site.

The 1,000,000-gallon (1.0-MG) Carsten Reservoir No. 2 is a circular, welded-steel tank measuring 81 feet in diameter with a 26.5-foot side water depth. This tank was constructed in 1999 and accumulates water from both North Star Reservoir and Behrman Well. The finished floor elevation is at 388 with an overflow elevation of 414.5 feet. The Carsten Reservoir No. 2 is the southern tank at the Carsten Reservoir site.

Carsten Reservoirs 1 and 2 are in good operating condition and fit for continued service. Regular maintenance, including washdowns and visual inspections, should be performed on each tank in order to spearhead potential problems and lengthen their useful life.

1.7 Pump Stations

The City of Banks' water system relies heavily on gravity flow from one end to the other. Water is collected from the Green Mountain Springs at the foothills of the Coast Range, north of the City, and gravity is utilized to transport the water to (in order) the SSFP, High Zone Reservoir, North Star Reservoir, Carsten Reservoirs No. 1 and No. 2, and into the central distribution system.

As described previously, the Behrman Well pumps groundwater out of the underlying aquifer at a consistent flow rate of 230 gpm. The water is injected with chlorine gas and is used for two purposes. The first is to supplement the water flowing down the hill from Carsten Reservoirs No. 1 and No. 2 and into the main service zone for distribution. The second purpose is to augment the storage in the Carsten Reservoirs when their water surfaces are below the operating set point.

1.8 Transmission and Distribution Pipelines

Once the surface water sources are filtered at the SSFP, water flows by gravity into the High Zone Reservoir, through the North Star Reservoir, and then continues south toward Banks via 15,300 feet of 6-inch-diameter steel pipeline. A 4-inch pressure sustaining / pressure reducing valve (PSV/PRV) was installed along the path of treated water, intended to sustain high

operating pressure upstream of the valve and reduce the pressure to the customers downstream of the valve. The act of regulating upstream pressure by setting the valve at the desired operating point creates two pressure zones. The two zones are designated "High" and "Main", corresponding respectively to upstream and downstream of the PSV/PRV. In order to attain the desired pressure regulation, the valve restricts flow across the pressure zones (Robert E. Meyer Consultants, 1995). To achieve maximum operating pressure in the High Zone, the North Star Reservoir water level is maintained nearly full. The PSV/PRV is set to maintain an operating pressure of 135 pounds per square inch (psi) at the lower end of the High Zone. Once water passes through the PSV/PRV and into the Main Zone, water continues south into the Carsten Reservoirs and main distribution zone within the city limits.

Banks has approximately 11 miles of pipelines comprising the water transmission and distribution system. A breakdown of the pipe diameters and lengths is included in Table 1-2 below.

Table1-2: Existing Distribution and Transmission Pipe Inventory

Purpose of Section	Pipe Size (inches)	Approximate Length (feet)	Material	Description
Transmission				
	6	4,000	Ductile Iron	Raw Water from Large Spring Intake Structure to SSFP
	4	1,500	PVC	Raw Water from Small Spring Diversion Dam to SSFP
	6	1,800	PVC	Treated water from SSFP to North Star Reservoir
	6	15,300	Tar-wrapped Steel	Treated and chlorinated water from North Star Reservoir to Carsten Reservoirs
Distribution				
	2	3,900	Steel	-
	6	5,400	Steel-PVC	-
	8	9,900	Ductile Iron	-
	10	700	Ductile Iron	-
	12	8,900	Ductile Iron	-
	14	4,700	Ductile Iron	-

The pipelines which make up the distribution system are located in public rights-of-way and are predominantly looped. The pipelines comprising the transmission system are not always as easily accessible due to the topography of the land in the hills near the Green Mountain Springs and SSFP. The majority of the distribution system serving downtown Banks and the Banks Estates Subdivision consists of 6" and 8" ductile iron (DI) pipe, with 12" and 14" DI pipelines on the east- and west-most periphery of the distribution system (aligned north-south), as well as the main arterial connectors (aligned east-west).

The 15,300-foot transmission pipeline was installed in 1953 and is in poor condition. The 1995 Water System Master Plan indicates that the line leaks and also constricts flow into the Main Zone. The pipe should be replaced with a 10-inch line in order to decrease system losses and provide greater capacity. Although the remainder of the distribution system is believed to be in good operating condition and fit for continued service, a Leak Detection Survey should be performed on the entire distribution and transmission system in order to pinpoint locations of high priority for replacement.

1.9 System Controls and Telemetry

The City's water system is controlled primarily by altitude valves, a PSV/PRV, and automatic pump start-up based on reservoir levels.

The altitude valve at the North Star Reservoir controls the flow into the SSFP. The opening of the valve cause the water to flow from the Green Mountain Springs intake structures, through the SSFP, and to the reservoir. Flow in the plant is stopped when the reservoir is full and the altitude valve closes. With the altitude valve closed, the raw water continues to flow from the intake structure to the SSFP and overflows at the filter basins.

When high raw water turbidity is measured at the plant, flow through the plant is stopped automatically by a valve in the plant influent line.

The PSV/PRV was installed on the main treated water transmission line approximately 1,000 feet north of US Highway 26. The purpose of this valve is to maintain functional operating pressure for the customers connected to the pipeline in the high zone (upstream of the PSV/PRV), and ensure excessive pressure is reduced for the main zone customers (downstream of the PSV/PRV).

The water level of the Carsten Reservoirs is maintained by the Behrman Well. The well pump is automatically activated when the water level in Carsten Reservoir No. 1 drops to a level set point. The pumps serve to boost the distribution system pressure and to fill the reservoirs. When Carsten Reservoir No. 1 is filled the pump automatically shuts off.

Chlorine residual is monitored by City Staff throughout the day and the feed rate is adjusted manually at the North Start Reservoir and the Behrman Well.

The existing telemetry system serves to monitor the filter plant, including raw and filtered water turbidity levels. Additionally, the water levels in the High Zone Reservoir, the North Star Reservoir, and the Carsten Reservoirs are monitored. Information is communicated to the monitoring computer located at City Hall.

1.10 Water Audit System

Banks has implemented a water audit program to track and maintain key water system information. The primary function of the software, which comes complimentary from the American Water Works Association, is to generate an Infrastructure Leakage Index. The water utility will continue to utilize this tool on a regular basis for monitoring overall system activity.

1.11 Service Areas

The City of Banks' water system contains two distinct service areas: the High Zone and the Main Zone. The zones are split by the PSV/PRV on Sellers Road, with the valve creating sustained pressure upstream of the valve, in the High Zone, and attempting to reduce excessive pressure downstream of the valve, in the Main Zone. Figure 1-4 shows the elements of the Banks water system that are present in each distinct pressure zone.

Public Works staff at the City report that the PSV/PRV is set to sustain an upstream pressure of 135 pounds per square inch (psi), and reduce the pressure across the valve to 85 psi. Therefore, the High Zone is served at approximately 312 feet of head, with the Main Zone being served with a head of 196 feet.

Amendment #1

1.12 Water System Flow Control

Refer to section 1 of Amendment #1 found in Appendix C.

Section 2: Water Requirements

This section contains the planning data and analyses used in the development of the population and water demand projections for the City of Banks Water Master Plan from 2008 through 2028.

2.1 Definition of Terms

The following definitions are used in this section:

Demand:	The total quantity of water supplied for a given period of time to meet the various required uses, including: residential, commercial, industrial, non-residential, fire fighting, system losses, and other unaccounted-for and miscellaneous uses.
Residential Demand:	Single-family home uses.
Non-Residential Demand:	Multi-family dwelling units, commercial, and industrial applications.
Unaccounted-for Demand:	The difference between the total amount of water withdrawn from the source supplies and the total amount of water billed to customers.
Fire Flow:	Flowrate requirements for buildings and structures fire suppression.

The different levels of water demands are designated as average daily demand (ADD), maximum monthly demand (MMD), maximum daily demand (MDD), and peak hourly demand (PHD).

Average Daily Demand:	The total volume of water delivered to the system in one year, divided by 365 days.
Maximum Daily Demand:	The maximum volume of water delivered to the system in any single day of the year, divided by one day.
Maximum Monthly Demand:	The maximum volume of water delivered to the system in any single month of the year, divided by the number of days in that month.
Peak Hourly Demand:	The maximum volume of water delivered to the system in any single hour of the year.

The different units to be used in this section include: gallons per minute (gpm), gallons per capita per day (gpcpd), and million gallons (MG).

2.2 Historical Population and Water Usage

In order to assess the future needs of the water system, an investigation into the historical water usage, historical population, and expected population has been conducted. Historical water use consumption was provided by the City in the form of meter records taken monthly for each customer. Water production information (system demand) was provided by the City in the form of recorded flows leaving the SSFP and Behrman Well. Historical population figures were obtained from the Population Research Center at Portland State University. Population projections through the 20-year planning period were provided by KJ Won, the City Planner for Banks.

Historical water use information and population data are used to estimate per capita usage rates and peaking factors relative to usage. These values, in conjunction with population projections, are used to estimate future water use.

In 2007, the City of Banks Water System served a population of 1,435 within the City limits and 305 outside the City limits, totaling 1,740 people. The City Planner estimates that City buildout will occur in 2024, with a total population served of 3,739 within city limits, and 305 outside (no further service connections outside City limits are allowed). City buildout will follow the expansion of the Urban Growth Boundary (UGB) and City limits, as well as the establishment of Urban Reserves. However, Banks is currently at buildout with regard to the available land inside the UGB. Therefore, the UGB needs to be expanded before any further City growth becomes available. The City is in the process of expanding the UGB, and it is anticipated that the process will culminate in mid to late 2009.

The City has also begun the process of identifying urban reserve areas outside of the UGB expansion. However, the size of the urban reserve has not been identified therefore a projected population cannot be estimate with any degree of accuracy.

The resulting total population served at final buildout will be 4,044 in the year 2024. However, this planning effort takes into account the planning for the City through 2028, four years after buildout. Therefore, the assumed population for the period 2024 through 2028 will remain at 4,044. A summary of the historical population and water usage information for the City's water system is included below in Table 2-1.

Table 2-1: Historical Population and System Demands

	Banks Water System Service Area Population			Total System Demands				
Year	Population Within City Limits [a]	Population Outside City Limits [b]	Total Service Area Population	ADD (gpm)	ADD (gpcpd)	MDD (gpm)	Peaking Factor [c]	MMD (gpm)
2005	1,430	305	1,735	179	149	392	2.2	304
2006	1,435	305	1,740	187	155	393	2.1	292
2007	1,435	305	1,740	185	153	457	2.5	261
						Average:	2.3	

Notes:

(a) 2005 - 2006 data from PSU-PRC "2006 Oregon Population Report". 2007 data provided by KJ Won, City Planner.
(b) Data provided by KJ Won, City Planner
(c) Peaking factor is calculated as MDD/ADD
ADD = Average Daily Demand
MDD = Maximum Daily Demand
MMD = Maximum Monthly Demand
gpm = Gallons per Minute
gpcpd = Gallons per Capita per Day

Throughout the years 2005 to 2007, 73 days of production data were not recorded, comprising 22 days in 2005, 29 in 2006, and 22 in 2007. The 73 days were representative of those days where either (or in some cases, both) the West or East Filter of the water treatment plant (WTP) was removed from service. To incorporate the missing data for averaging purposes, daily meter readings were interpolated where appropriate, and total water production averaged over the period of missing data. This analysis does not result in added water production, but rather distributes the recorded outflows over the missing days resulting in the ability to calculate daily averages (the ADD values reported in Tables 2-1 and 2-2) with confidence in their accuracy.

Of important note is that in 2006 each filter basin of the WTP was removed from service for an extended period of time in order to replace the sand media. This is a maintenance requirement that ensures the City's drinking water is treated at or above drinking water standards. The West Filter was offline from June 1st until June 6th; the East Filter was offline from October 19th until October 29th.

The Banks water system is split into two distinct pressure zones, as discussed in Section 1. The High Zone has appreciably lower demands because it has a significantly lower population. Splitting the total system demands into those required by each zone also allows for water supply and storage requirements to be determined for each zone, as discussed in Section 4. For this analysis, the per capita demands from Table 2-1 are unchanged and are used to estimate the demands in each service zone. The calculated historical average daily, maximum daily, and maximum monthly demands for each service zone in the Banks water system are presented in Table 2-2.

Table 2-2: Historical Population and System Demands in the Individual Service Areas

Year	High Zone Service Area Population			High Zone Demands						
	Population Within City Limits [a]	Population Outside City Limits [b]	Total High Zone Population	ADD (gpcpd)	ADD (gpm)	MDD (gpcpd)	MDD (gpm)	Peaking Factor [c]	MMD (gpcpd)	MMD (gpm)
2005	0	151	151	149	16	326	34	2.2	253	26
2006	0	151	151	155	16	326	34	2.1	241	25
2007	0	151	151	153	16	378	40	2.5	216	23

Year	Main Zone Service Area Population			Main Zone Demands						
	Population Within City Limits [1]	Population Outside City Limits [2]	Total Main Zone Population	ADD (gpcpd)	ADD (gpm)	MDD (gpcpd)	MDD (gpm)	Peaking Factor [3]	MMD (gpcpd)	MMD (gpm)
2005	1,430	154	1,584	149	164	326	358	2.2	253	278
2006	1,435	154	1,589	155	171	326	359	2.1	241	266
2007	1435	154	1589	153	169	378	417	2.5	216	238

Notes:

(a) 2005 - 2006 data from PSU-PRC "2006 Oregon Population Report". 2007 data provided by KJ Won, City Planner.
(b) Data for High Zone is calculated as the ratio of 47 (total connections in the High Zone) over 95 (total connections outside City Limits) times 305 (total population outside City Limits). Data for Main Zone is calculated as the difference between 305 total and 151 in High Zone.
(c) Peaking factor is calculated as MDD/ADD
ADD = Average Daily Demand
MDD = Maximum Daily Demand
MMD = Maximum Monthly Demand
gpm = Gallons per Minute
gpcpd = Gallons per Capita per Day

2.2.1 Peaking Factors

The relationships between the various water system demands are called peaking factors. For the years 2005 through 2007, the peaking factors are based on both treated water records supplied by the City as well as industry-standard peaking factor assignments. The peaking factor presented in Tables 2-1, 2-2, and 2-3 are calculated as the MDD divided by the ADD. The average of this peaking factor over the period from 2005 through 2007 is 2.3. Typical MDD/ADD peaking factors range from 2.0 – 2.5 (American Water Works Association [AWWA], 1989) with the higher end representing a greater variance from the average demand to the maximum. For the purposes of this report, the average value of 2.3 has been chosen to represent this variance and is used for demand projections in Table 2-3. Using a value of 2.3 results in a practical yet conservative estimate of the future demands on the water system.

Using historical data presented in Table 2-1, an average value of 1.7 was calculated for the MDD/MMD peaking factor. This value will be used for water demand projections for this study.

No PHD data were available for estimating the PHD/MDD peaking factor, therefore a typical value of 1.5 (AWWA, 1989) was assumed for this study. Estimated PHD values are included in Table 2-3.

2.3 Population and Water Demand Projections

Future water demand was projected based on the estimated per capita use presented in Table 2-1 and future population projections supplied by the City Planner. Figure 2-1 illustrates the population projections for the City throughout the 20-year planning period from 2008 through 2028. This analysis assumes that the rate of increase in water use for commercial and industrial users will follow the same pattern as for the residential population. The result of this assumption is a conservative projection of future water needs by applying the best available information. It is unknown whether or not the City will experience either the elimination or addition of large water users, and therefore this planning effort bases the projections for all future water use on the rate of increase of the permanent residential population. However, even with the incorporation of industrial and commercial water users in the per capita projections, the resulting values appear consistent with the national averages of approximately 100 – 150 gpcpd for residential use only.

The per capita water production over the years 2005 through 2007 was consistent and averaged approximately 152 gpcpd. Although this value is in line with the national averages, water conservation practices are recommended and are addressed further in the Water Management and Conservation Plan, a concurrent planning effort that elaborates upon recommended conservation efforts, including public education and conservation programs.

The City's water system ADD and MDD projections are summarized in Table 2-3, with Figure 2-2 illustrating the demand projections. The 2008 ADD and MDD are 198 and 456 gpm, respectively, while the 2028 ADD and MDD projections are 428 and 984 gpm, respectively. The MMD and PHD at the end of the planning period are 656 and 1476 gpm, respectively.

Population and demand projections throughout the 20-year planning period, in conjunction with the historical records analyzed from 2005 through 2007, are presented in Table 2-3 below.

Table 2-3: Population and Demand Projections

Year	Banks Water System Service Area Population			Total System Demands					
	Population Within City Limits [a]	Population Outside City Limits [b]	Total Service Area Population	ADD (GPM) [c]	ADD (gpcpd) [c]	MDD (GPM) [d]	Peaking Factor [d]	MMD (GPM) [e]	PHD (GPM) [f]
2005	1,430	305	1,735	179	149	392	2.2	304	-
2006	1,435	305	1,740	187	155	393	2.1	292	-
2007	1,435	305	1,740	185	153	457	2.5	261	-
2008	1,570	305	1,875	198	152	456	2.3	304	684
2009	1,705	305	2,010	213	152	489	2.3	326	734
2010	1,840	305	2,145	227	152	522	2.3	348	783
2011	1,975	305	2,280	241	152	555	2.3	370	832
2012	2,110	305	2,415	256	152	588	2.3	392	882
2013	2,245	305	2,550	270	152	621	2.3	414	931
2014	2,380	305	2,685	284	152	653	2.3	436	980
2015	2,515	305	2,820	298	152	686	2.3	458	1029
2016	2,650	305	2,955	313	152	719	2.3	479	1079
2017	2,785	305	3,090	327	152	752	2.3	501	1128
2018	2,920	305	3,225	341	152	785	2.3	523	1177
2019	3,055	305	3,360	356	152	818	2.3	545	1227
2020	3,190	305	3,495	370	152	851	2.3	567	1276
2021	3,325	305	3,630	384	152	883	2.3	589	1325
2022	3,460	305	3,765	398	152	916	2.3	611	1374
2023	3,595	305	3,900	413	152	949	2.3	633	1424
2024	3,739	305	4,044	428	152	984	2.3	656	1476
2025	3,739	305	4,044	428	152	984	2.3	656	1476
2026	3,739	305	4,044	428	152	984	2.3	656	1476
2027	3,739	305	4,044	428	152	984	2.3	656	1476
2028	3,739	305	4,044	428	152	984	2.3	656	1476

Notes:

(a) 2000 - 2006 data from PSU-PRC "2006 Oregon Population Report". 2007 - 2028 data provided by KJ Won, City Planner, assuming a uniform average growth rate over the period from 2007 to 2024, when expected full buildout will occur
(b) Data provided by KJ Won, City Planner
(c) Future projections assume the 3-year per capita average (years 2005-2007) for the year for the entire 20-year planning period
(d) Future projections assume an MDD/ADD peaking factor of 2.3 based on historical records and typical values
(e) Future projections assume the MMD is equal to the MDD divided by 1.5

PHD is assumed to be 1.5 times the MDD
ADD = Average Daily Demand
MDD = Maximum Daily Demand
MMD = Maximum Monthly Demand
GPM = Gallons per Minute
gpcpd = Gallons per Capita per Day
Note: The dotted line separating 2007 and 2008 represents when population and demand projections commence

Water demand projections are based on estimated per capita use and future population. Water use characteristics were obtained from the City's billing and production data. These data were used to approximate the general water usage characteristics for the City, which are presented in Table 2-4.

The population projections included in Table 2-3 culminate with a buildout population of 4,044 residents served by the City's water system, with 3,739 inside city limits and 305 outside. The total number of people served is significantly higher than that estimated in the 1998 Water System Water Master Plan Update (Bookman-Edmonston, 1998), due to a more conservative growth plan being adopted by the City in response to the opportunity to extend its UGB and annex nearby urban reserves. However, the 1998 Plan estimates that the number of service connections outside city limits will grow, while this planning effort leaves this total at 305 people. This directly results from a commitment by the City to not allow new service connections outside of city limits, and therefore not changing the amount of people served (as well as demand projections) in the High Zone service area throughout the 20-year planning period.

2.3.1 Potential Impacts of Urban Reserve Areas

Although population projections through 2028 were presented in Table 2-3 in conjunction with criteria developed by the City planner, it is possible that Banks could see even more expansion and growth through the planning period. Banks is currently looking for areas to expand beyond the proposed UGB expansion. These surrounding lots and parcels are being identified as urban reserve areas (URAs), which could accommodate growth beyond what has been predicted for buildout. No population totals have been developed in response to URA acquisitions, but it is important to note that there is a potential for substantial growth in Banks, and population totals eclipsing 6,000 residents.

As the potential population growth due to the URA cannot be identified with any accuracy at this time, it will not be used to evaluate water source, treatment or storage.

2.3.2 Unaccounted-for Water

Unaccounted-for water in the Banks' Water System is defined as the difference between the total water produced by the system and the total amount of water billed to customers. This difference between treated water records from the WTP and the Behrman Well and metered customer data results from leakage losses, meter discrepancies, hydrant and main flushing, street sweeping, operation and maintenance uses, unauthorized connections, fire flow uses, and other un-metered miscellaneous uses.

The average unaccounted-for water in the Banks Water System is 26.4 MG per year, or an average of nearly 27 percent of the total water treated. Table 2-4 displays a summary of the total water produced and consumed with the resulting unaccounted-for water, from the years 2006 and 2007, and the corresponding two-year averages. A realistic goal for unaccounted-for water for a water system of the City's size is between 10 and 15 percent. Ensuring that the City is metering all users and is aggressively detecting and repairing water system leaks will help to reduce the amount of unaccounted-for water. Additionally, water conservation by the City and water customers is an important and effective method of decreasing the amount of water lost from the City's Water System.

Unaccounted-for water rates greater than 15 percent could trigger more stringent management and conservation requirements in the Water Management and Conservation Plan, and may have an effect on Banks' ability to acquire more water rights.

Table 2-4: General Water Use Characteristics

	Units	2006	2007	Average
Total Treated Water Produced	(MG)	98.4	97.4	97.9
Water produced by the SSFP	(MG)	63.8	68.0	65.9
Water produced by the Behrman Well	(MG)	34.6	29.4	32.0
Percentage water produced by SSFP	(%)	64.8	69.8	67.3
Percentage water produced by Behrman Well	(%)	35.2	30.2	32.7
Total Metered Consumption	(MG)	74.4	68.7	71.5
Unaccounted-for water	(MG)	24.0	28.7	26.4
Unaccounted-for water	(%)	24.4	29.5	26.9
Service area population	(people)	1740	1740	1740
Per capita raw water usage	(gpcpd)	155	153	154

Notes:

MG = million gallons
SSFP = slow-sand filter plant
gpcpd = gallons per capita per day

2.3.3 Large-Volume Users

Large-volume users create high point loads on the system and need to be applied to the water system model to accurately analyze the system. The large-volume users for the City are comprised of various usage types; irrigation, residential, industrial, institutional, and commercial. The top 10 water users in the City were compiled from meter records and are represented in Table 2-5. It is important to note that the ADD is based on annual usage so that users who require large volumes of water for irrigation in the summer are included in this category. The actual daily and hourly peak use will vary depending on the specific use.

The City's top water user is the Arbor Park. The Park's service connections are used for irrigation purposes. These Park's services are owned and operated by the Northwest Community Home Owners Association and in 2007 the Park used 3.7 MG of water. The second-largest user is Quail Hollow Apartments, which required 2.1 MG of water for its residents in 2007. Currently, the only industrial service connection is Banks Lumber Company. The lumber producer has historically been one of the largest water users of the City's metered customers. In 2007, it consumed a total volume of 2.0 MG, which is the third-highest amount used by a single service according to the City's meter records.

Table 2-5: Current Large Volume Water Users

User	Address	Description	Type	2007 Volume (MG)	2007 ADD (gpm)
NW Community – HOA	Arbor Village	Arbor Park Area	Irrigation	3.7	7.0
Quail Hollow	621 Morrison Street	East & West Apartments	Residential	2.1	4.0
Banks Lumber Co.	NW Banks Road	Lumber Mill	Industrial	2.0	3.7
Banks School District # 13	450 S. Main Street	High School, District Office	Institutional	1.7	3.2
Banks Sunset Park Assoc.	460 S Main Street	Privately-Owned Park	Irrigation	1.1	2.1
Banks School District # 13	42350 NW Trellis Way	Jr. High School	Institutional	1.1	2.1
Oak Village	660 S Main Street	Deli & Laundry	Commercial	1.0	1.8
Dale Evers	14735 NW Sellers Road	Dairy Farm	Commercial	0.6	1.1
Sunset Laundry Mat	180 S Main Street	Laundry	Commercial	0.6	1.1
Banks Billiards	111 N Main Street	Billiards	Commercial	0.4	0.8

While incorporating the large-volume water users into the system hydraulic analysis and planning for future water demands, the projected demands for the current large-volume users are not expected to change significantly. However, it is expected that new large-volume water users will be added to the system during the study period, resulting in the need to add additional large-volume water users to the distribution system hydraulic model for the purpose of the hydraulic analysis under buildout conditions.

2.3.4 Fire Flow Requirements

Fire flow demand is the amount of water required to fight a fire for a specified period of time. Fire protection for the City is provided by the Banks Fire Department (which serves the land within City Limits) and private fire suppression companies (which serve the residential areas lying outside of City Limits). One fire hydrant is available to the High Zone, while numerous hydrants exist in the Main Zone throughout the distribution system. To plan for necessary fire-suppression flows, the Banks Fire Department subscribes to the National Fire Protection Agency (NFPA), Standard 1142: Standard on Water Supplies for Suburban and Rural fire fighting outside of the City Limits. Within the city Limits the Oregon fire Code Appendix B is used as the guiding criteria that helps the Fire Department plan for fire fighting. Another common method of assigning fire flow rates is based on the Insurance Services Organization (ISO) classification rating that the water required to combat a fire is dependent on the specific characteristics of that building. These factors include site specific issues such as construction, occupancy, exposure, and communication.

Previous City water master plans have recommended fire suppression flow for the two service zones. The High Zone is rural and is assigned a fire suppression requirement that assumes a low-density residential setting with mostly single-family structures: 1,500 gpm for 2 hours. The Main Zone is assigned a commercial fire fighting requirement that allows for large commercial, industrial, or institutional developments: 3,000 gpm for 3 hours. The residential areas within the City Limit needs 1,000 gpm for 2 hours. These values are acceptable and appropriate for their respective applications in the City, and the overall system will be evaluated for fire flow capability assuming the same requirements.

2.3.5 Water Management and Conservation Planning

Concurrent with this water master planning effort, a Water Management and Conservation Plan (WMCP) is being completed that addresses the water supply and conservation needs for the City as population grows and higher demands are placed on the water system. Consult the WMCP for supply- and conservation-related plans and strategies heading into the future.

Figure 2-1
Population Projections

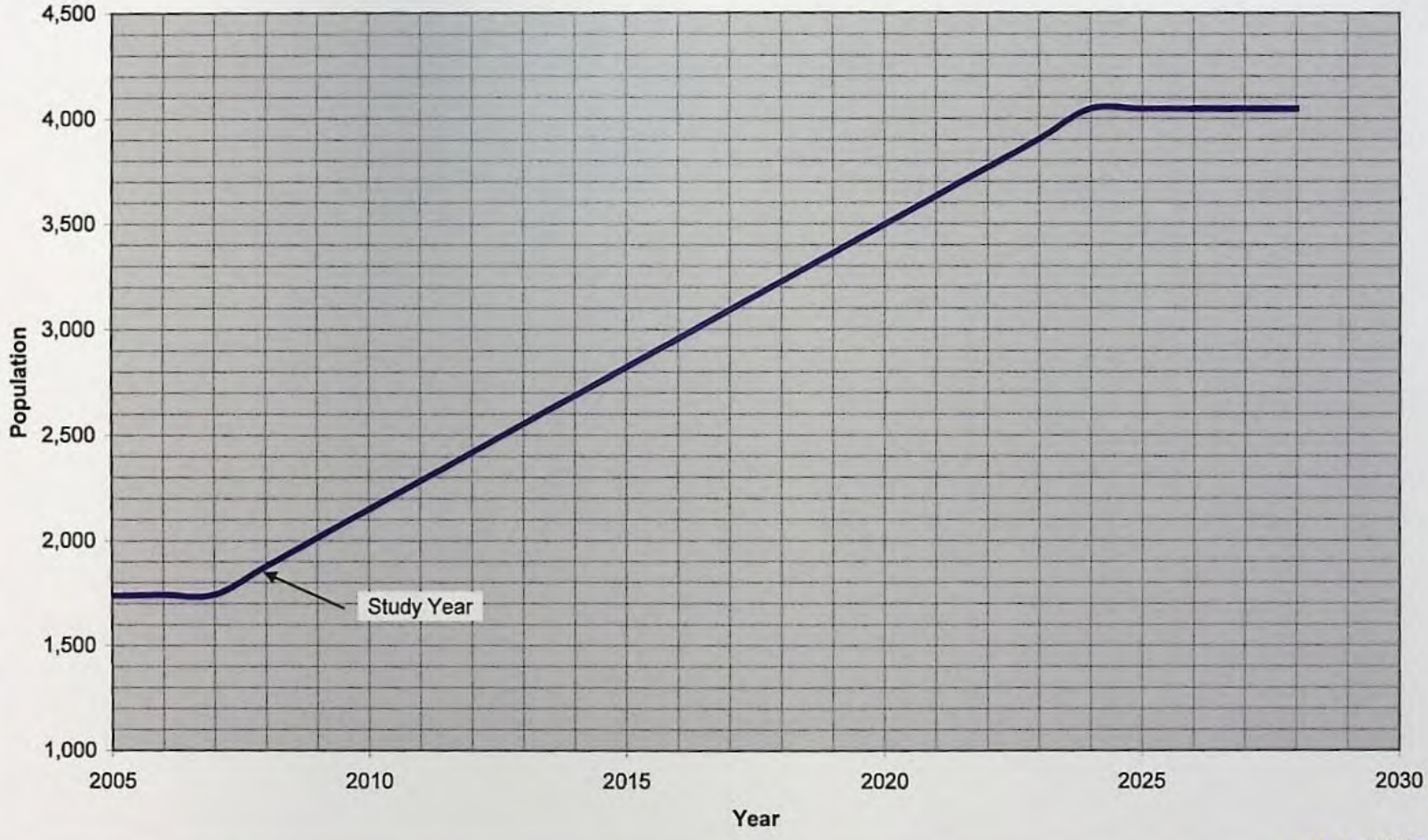
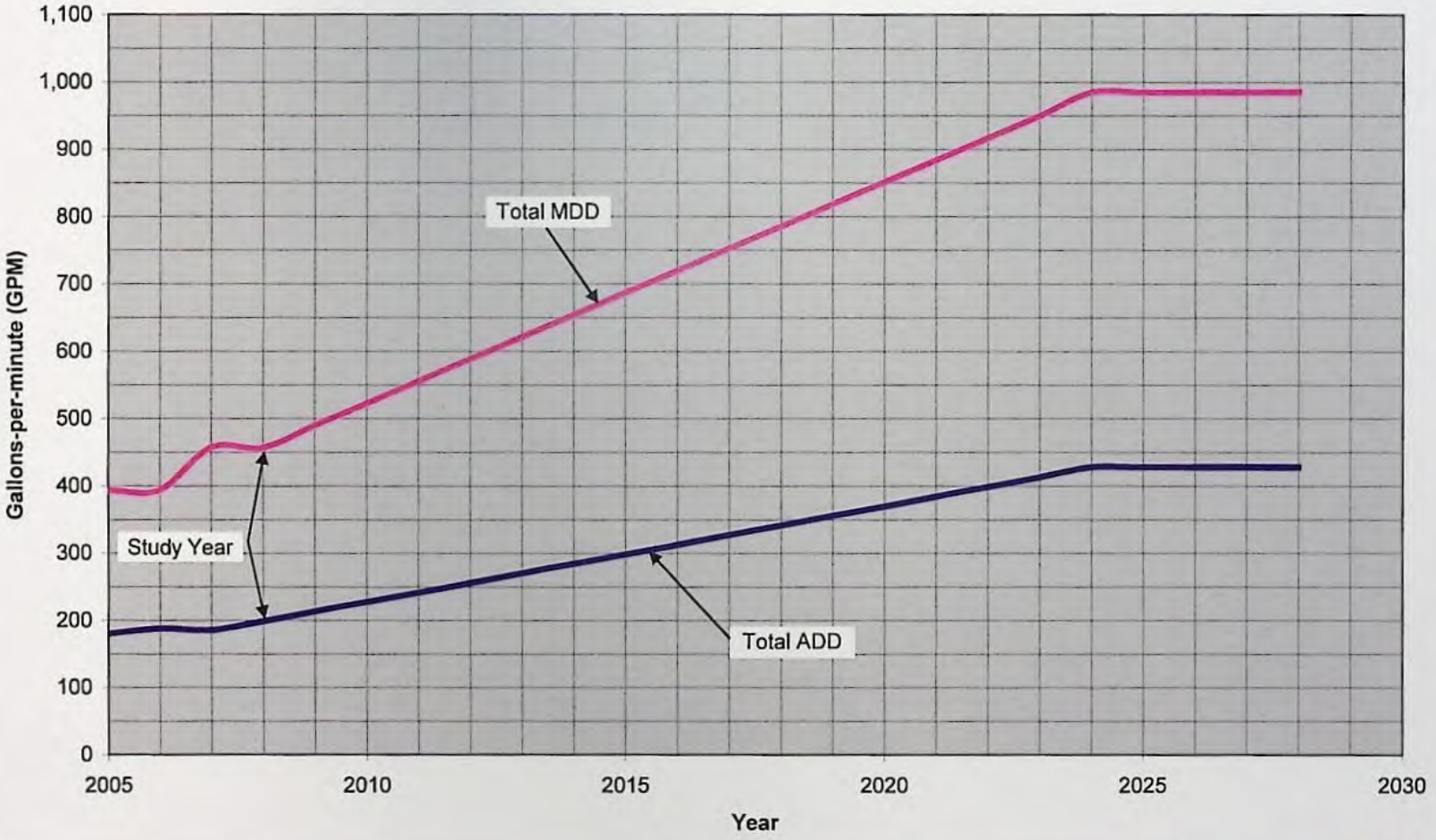


Figure 2-2
Demand Projections



Section 3: System Analysis Criteria and Hydraulic Model

This section presents the criteria used for the master plan system analysis of the existing and future water system presented in Section 4. This section also contains a discussion about the hydraulic model and its development and verification process.

3.1 Master Plan Analysis Criteria

The following criteria were used to evaluate the adequacy of the water system to provide for the existing (2008) and projected (2028) demands. All Oregon Department of Human Services Drinking Water Program (DWP) and Oregon Water Resources Department (OWRD) requirements are met through the proposed criteria, which are acceptable standards of practice in typical master plan studies. The analysis criteria contained in this chapter are intended for water system master planning analysis only and are not intended as specific development standards.

Table 3-1 presents a summary of the analysis criteria explained in the following subsections. Included in the summary is a comparison of criteria used in this WMP to those used in the 1995 WMP and the 1998 Update as well as the regulatory drivers for the criteria, where applicable.

Table 3-1: System Analysis Criteria

No.	Item	Criteria Used in Previous Master Plans (1995 and 1998)	Applicable Regulations	Recommended Value
1	Source	Source capacity shall meet peak weekly demands.		Source capacity shall meet the MDD.
2	Fire flow for single family residential areas	1,500 gpm for 2 hours, storage volume of 180,000 gallons	ISO recommends a minimum of 1,000 gpm for 2 hours Oregon DWP has no fire flow requirements. However, a minimum residual pressure of 20 psi must be maintained at all times.	Minimum of 1,500 gpm for 2 hours, storage volume of 180,000
3	Fire flow for multi-family commercial, industrial, and institutional areas	3,500 gpm for 3 hours, storage volume of 630,000 gallons	For other types of habitational buildings, ISO's maximum needed fire flow is 3,500 gpm.	Minimmum of 3,500 gpm for 3 hours, storage volume of 630,000
4	Residential piping: sizing and looping			12-inch-diameter for major loops 8-inch-diameter for internal grid 6-inch-diameter min. for dead-end mains (less than 250 feet in length). Maximum velocity should be 6 fps during PHD. Higher velocities are allowed for fire flow demands.
5	Transmission Mains: sizing			Size the pipelines for a maximum velocity of 8 to 10 fps during PHD.
6	Operating pressures		Oregon DWP requires a minimum of 20 psi at all times.	During normal operation (any time except during fire flows) the operating range shall be 35 to 100 psi at the service connection. During fire flow, the minimum shall be 20 psi.
7	Pressure reducing valves on customer services		Oregon Plumbing Code allows a maximum of 80 psi. If higher, the addition of a PRV is required	Customers shall provide a PRV for pressures above 80 psi. The City shall provide pressure reduction when changes to the water system result in pressures greater than 80 psi.
8	Equalization storage volumes			25% of the MDD
9	Emergency storage volumes	Supply peak weekly demand		Twice the ADD
10	Total storage	Sum of peak weekly demand and fire flow volumes		Sum of equalization, emergency, and fire storage volumes.
11	Pump station sizing			Provide MDD for 24 hours with the largest pump out of service.
12	Reservoir turnover			Depends upon water quality. Many systems do not experience water quality issues despite the water age being greater than AWWA recommendations.

3.1.1 Source

The source capacities must be adequate to supply water demand to each service zone. Both service zones contain storage facilities for peaking equalization, and therefore the source capacity required is the MDD. Demands greater than the MDD would be served from the reservoir storage.

3.1.2 Storage

As no storage criteria are set by the DWP, typical standards of practice for master plan studying have been applied. One such standard is to divide the total storage requirement into three components: peaking equalization, fire flow, and emergency storage. The total storage requirement for the City's water system is recommended to be the sum of these three components as follows:

- Peaking equalization storage is used when demands are greater than the MDD supply capability of the system. Storage for peaking equalization is calculated as 25 percent of the MDD.

- Fire flow storage volume is determined based on fire flows of 3,000 gpm for three hours in commercial and industrial areas, 1,000 gpm for two hours in urban residential areas, and 1,500 gpm for two hours in the rural residential areas.

- Emergency storage requirements have the most flexibility in sizing and depend largely on the individual system makeup, lengths of historical emergency outages, and the level of risk the utility is willing to take. This plan assumes an emergency storage volume requirement of twice the ADD.

3.1.3 Pipeline

The distribution pipeline network must be able to meet the PHD and maintain pressures greater than 35 pounds per square inch (psi) while maintaining water velocities in the pipeline no greater than 8 feet per second (fps). Additionally, pressures in portions of the distribution system where there are service connections should not exceed 80 psi without the use of individual pressure-reducing valves as dictated in the Uniform Plumbing Code for Oregon. Water mains should be looped wherever possible in order to prevent dead-ends, increase reliability in the system, and maintain high water quality. Water mains should be sized for maximum potential demands and fire flow requirements according to the city zoning or planning area.

The pipeline network must provide the required flows for fire and MDD with a minimum residual pressure of 20 psi, established by the DWP, and with a maximum pipeline flow velocity of 10 fps. The size of network pipes must also be sufficient to handle the refilling of reservoirs during low demand periods of the day. The pressures in the transmission system should not fluctuate by more than 20 to 30 psi from normal ADD pressures as sources refill the reservoirs.

3.2 Computer Simulation Model

The H2ONet network analysis software was selected to simulate the hydraulics of the City's water system. H2ONet is a private domain software program developed by MWH Soft, Inc. Version 6.0 of H2ONet is the AutoCAD-based modeling software program that was used in this master plan study. AutoCAD files provided by the City, Washington County, and Clean Water Services were used to develop the model, which contains pipe, node, pump, source, and reservoir data. Nodes are typically interconnecting points of the pipeline network; however, they may be placed at intermediate locations on pipes where demands are required.

Operational scenarios have been introduced into the water system model, which in turn provides an output indicating how the system will respond. The output lists the pressure and hydraulic grade line at each node, velocity and friction losses through each pipe segment, and the operating conditions of all the facilities in the model.

The fraction of the total system demand allocated to each service zone's piping network was estimated based on the fraction of total service connections lying inside of each respective pressure zone.

Section 4: Water System Analysis

This section contains an analysis of the City of Banks' (City) water system for existing and future buildout demands. The analysis includes the evaluation of the water source, treatment, disinfection, storage, transmission, and distribution components of the water system.

4.1 Demand Allocation and Growth

The population of Banks is expected to more than double over the 20-year planning period. As depicted in Table 2-3 in Section 2, this will result in a growing water demand. The elevated demands are all allocated to the lands within City Limits (or areas where the City is expected to expand into), as City staff expects to withhold new service connections to the water system that lie outside the City.

4.2 Water Source and Supply

The City has historically utilized water diverted from Green Mountain Springs as their dominant water source. However, reductions in minimum summer flow rates and high turbidity events in the winter may limit the reliability of the Green Mountain Springs as an adequate source of water for the City's growing population. Minimum summer flows from the large spring have reportedly decreased from approximately 110 gpm in the early 1980's to approximately 90 gpm presently.

Turbidity levels in raw spring water may increase during high flow events in wet winter months. Spring discharge at the surface flows some distance within a marine sedimentary bedrock channel before collecting in the concrete catchment basins, and high flow events often lead to increased channel erosion and higher turbidity. Because the water treatment plant slow-sand filters are sensitive to high turbidity levels in raw water, diversion to the plant is halted on occasion in the winter. The small springs are more prone to high turbidity due to the longer flow paths between the outlets and the catchment. The small springs are not currently utilized due to the regularity of high turbidity events.

The Behrman Well was installed in 1979 as a source of supplemental water supply during the summer months. As the population has grown and spring flows have decreased, the Behrman well has become the City's dominant water source, and is pumped up to 18-hours per day during the summer months. Production from the well has remained a fairly constant 230 gpm since the well was installed, and the well is assumed to be a reliable source of water over the long term. However, the well pump and motor are aging and heavily used, and may present a limitation to the mechanical reliability of the well.

Well No. 2 was drilled and completed in the Columbia River Basalt aquifer within 100 feet of the Behrman Well in 2005. Preliminary pump tests conducted at Well No. 2 indicated the presence of a negative flow boundary and drawdown interference at the Behrman Well (Golder, 2008). Due to these limitations, Well No. 2 has not been outfitted with pump and transmission infrastructure to develop the well as a supply source. Pending further testing, once Well No. 2 is put into production, it will serve as either a backup water supply for non-concurrent use or an additional water supply and could be used simultaneously with the Behrman Well. The development of Well No. 2 is listed in the Capital Improvements section as Project 1, and is shown on Figure 4-1.

Table 4-1 summarizes the limitations of the City's current water supply sources. The reliable water supply rate available to the City during summer peak use periods is an instantaneous 340 gpm, or approximately 490,000 gallons per day given current operational schemes.

Table 4-1: Use Limitations of Existing Permitted and Certificated Water Supplies

Application Number	Use Limitations	Current Reliable Minimum Rate
S-9207	Limited summer flow rate of 90 gpm, high potential winter turbidity levels	90 gpm
S-65611	Limited summer flow rate of 20 gpm, frequently high winter turbidity levels, currently not utilized	0 gpm
G-8476	Maximum pumping rate at Behrman Well limited to by pump size	250 gpm
G-15887	Well #2 installed, pumping and distribution infrastructure not currently in place	0 gpm

Based on historical water production data and the current reliable minimum rate of water supplies, the City is deficient in water supply. To meet the average MDD for the years 2005 through 2007, a supply of 414 gpm or 0.60 million gallons per day (mgd) is needed. As shown in Table 4-1, during the summer months when MDD is most likely to occur, the total water supply is 340 gpm or 0.49 mgd. This represents a deficiency of 74 gpm or 0.11 mgd that will continue to increase as the City's population increases.

In order to supply water for the projected 20 year population, the City will need to obtain an additional 644 gpm.

4.2.1 Identification of Source Options

It is recommended that the City plan to meet future system demands through conservation measures that will minimize water loss from the system, encouraging water conservation by customers, and developing additional sources of supply in line with the City's current water right holdings. Demand projections, outlined in Section 2.3, indicate the City cannot currently meet the 2008 Maximum Day Demand, and will not meet the Maximum Monthly Demand by 2013. In addition to conservation measures, additional water supply will be required to meet these demands. A number of supply options are reviewed in this section and are categorized under the general areas of near-term and long-term supply options.

In the short term, it is recommended that the City continue measured development and exploration of additional groundwater resources to ensure near-term municipal demands are met and to develop system redundancy to supply water in the event of primary water source disruptions. In the long term, it is recommended that the City continue to evaluate options to develop interconnections with regional water suppliers.
In order to compare the source options, relative opinions of probable construction cost will be provided for all the options in this chapter instead of only the recommended improvements. Note that some of these costs have not been rounded. In the recommended CIP in chapter 6 they will be rounded.

4.2.1.1 Near Term Options

Currently, several short-term source water alternatives exist for the City of Banks. These options include completing the development of the existing ground water right permits in Table 1-1, developing Well #2, exploring options for utilization of the Quail Valley Golf Course Well, and assessing options for the Southwest Wellfield. The City may also consider improving the delivery of water supplies on existing spring water right certificates by investigating options to transfer spring water rights to groundwater rights (Sellers Road Wellfield); thereby reducing or eliminating the need for filter treatment.

4.2.1.2 Behrman Well #2

This supply option will provide near term additional water supply to the City and act as a back up well to the Behrman Well #1. Development of the Well #2 option may yield up to 450 gpm of reliable water supply. If the well is found to have the capacity to sustain this amount of water for a sufficient period of time, the development of the pumping and conveyance system could increase the reliable supply by 220 gpm, assuming that the Behrman Well was not in operation.

This option will require a long-term constant-rate pumping test to prove out the pumping capacity and accurately size the pumping system. This work is already under way, but results are not in yet. Other infrastructure required will include the wellhead design and construction, a chlorine treatment system, and a short conveyance pipeline to intertie with the Carston reservoirs.

The Scope of Work to develop Well #2 is as follows:

1) Phase I - Hydrogeologic Feasibility Study
    a. Pump Test Well
    b. Analysis and Reporting
    c. Water Right Permit Amendments
    d. Engineering Design of Wellhead Improvements, Controls and Conveyance
2) Phase 2 –Design & Construction
    a. Construction of Wellhead Improvements, Controls and Pipeline

Cost Estimate

Hydrogeologic Feasibility Study parts A and B. This work is under way.

Water Right Amendment	$12,000	
Design & Construction -	$670,000	if additional source
	$540,000	if backup supply only

4.2.1.3 Quail Valley Golf Course Well

The Quail Valley Golf Course located to the east of the City of Banks has an existing groundwater well which could be a potential alternative source of water. Current water rights for this well are permitted for a maximum rate of 0.89 cubic feet per second (399 gpm) for supplemental irrigation. This well is presently pumped to storage ponds on the golf course. The irrigation water is then pumped from the pond to irrigate the golf course when Tualatin Valley Irrigation District cannot supply irrigation water to the course. If found to be hydraulically connected, this well could yield a significant municipal water supply under the City's existing water rights.

Use of this water supply option would require a Memorandum of Understanding (MOU) between the City and Quail Valley Golf course regarding emergency use, and annexation of part or all of the golf course and surrounding lands. A water supply pipeline would be constructed from the well to an intertie in the Behrman well to tie into the existing pipeline along NW Banks Road at the Behrman well (see Figure 5-3), which would be approximately 4000 feet long.

The scope of work to develop the Quail Valley Golf Course well as a City source is as follows:

3) Phase I - Hydrogeologic Feasibility Study
    a. Water Right Consultation with Oregon Water Resources
    b. Access Agreements and Right of Way Feasibility
    c. Pump Test Well
    d. Analysis and Reporting
    e. Engineering Design of Wellhead Improvements, Controls and Conveyance
4) Phase 3 –Design & Construction
    a. Land Acquisition and Right of Way
    b. Water Right Permit Amendments
    c. Construction of Wellhead Improvements, Controls and Pipeline

Cost Estimate

Hydrogeologic Feasibility Study	$37,000
Design & Construction parts a and b	$28,000
Design & Construction part c	$1,170,000

4.2.1.4 Sellers Road Wells

This water supply option would require a hydrogeologic feasibility study of the basalts above the existing spring sources north of the City. This would include drilling and pump testing a well, and would require a water right transfer of a portion of the spring water right to the new groundwater well.

The City maintains two spring intakes north of town, located off Sellers Road. The supply from the springs has experienced long-term reductions in production capacity over the last 20 years and the surface water captured requires expensive filtration and treatment to meet drinking water quality standards. If this option proved successful, the water drawn from the groundwater source in connection with the springs could be increased from the current 90 gpm to the full water right of 269 gpm, an increase of 179 gpm. The groundwater from the wells is unlikely to require filtration treatment. The potential improved water quality could greatly reduce or eliminate the cost of operating the City's slow sand filter. The hydrogeologic feasibility study would include refining a hydrogeologic conceptual model, selecting a well location based on hydrogeologic features, legal access to Sellers Road, and then drilling a test well and completing a pumping test.

A successful outcome to the feasibility study could initiate the development of a well field along Sellers road. Two to five wells could be drilled to a depth of 50 to 350 feet, with an estimated production of approximately 50 to 150 gpm each. In addition to drilling the wells, other infrastructure would be required including; power supply, approximately 3500 feet of pipeline conveyance from the new wells to a tie-in at the existing spring intake, pumps and motors, and a control system for operations.

The scope of work to develop the Sellers Road Wellfield is as follows:

1) Phase I - Hydrogeologic Feasibility Study
    a. Water Right Consultation with Oregon Water Resources
    b. Geophysical Survey - Evaluation of Basalt Thickness
    c. Access Agreement and Right of Way Feasibility
    d. Drill Test Well (1-well to 200 ft.)
    e. Pump Test Well and Monitor Springs
    f. Analysis and Reporting
2) Design and Construction of Well Field (Assume 4-Wells to 200 ft.)
    a. Land Acquisition and Right of Way
    b. Drill 4-Wells, Pump Test, Analysis and Report
    c. Water Right Consulting for Transfer of Certificates
    d. Design for pumps and motors, wellhead, conveyance, and controls
    e. Construction of wellhead development and pipeline

Cost Estimate

Hydrogeologic Feasibility Study	$150,750
Design and Construction parts b and c	$450,000
Design and Construction parts a, d and e	$2,380,000

4.2.1.5 Southwest Wellfield

Located to the southwest of the City of Banks is an area of land that has been considered as a possible location for a new well field. The location is to the west of Nehalem Hwy between NW Wilson River Hwy and NW Dierick Road. This land is currently being used for agricultural purposes, but may be in a location which could produce significant quantities of groundwater.

It is proposed that two wells could be drilled in this area. A pipeline would be constructed to tie in to the existing water distribution system for the City to the north along S Main Street, and would be approximately 2500 feet in length.

The City's junior water right permit allows for development of up to 1cfs (~450 gpm) of additional water supply from the CRB aquifer. A 300-gpm portion of Permit G-16312 would be available for development after the successful development of Well #2. Similar production wells completed in the CRB aquifer in the area have production rates ranging from approximately 100 to 500 gpm (Squire, 1994). A new well located on the south side of town may encounter as much as 400 feet of overburden sediment, and would benefit from being drilled at least 400 feet into the CRB aquifer, for a total depth of approximately 800 feet.

The scope of work to develop the well field southwest of City center

1) Phase 1 - Hydrogeologic Feasibility Study
    a. Water Right Consultation with Oregon Water Resources
    b. Access Agreements and Right of Way Feasibility
    c. Drill Test Well (Assume 1-Wells to 800 ft.)
    d. Pump Test Well
    e. Analysis and Reporting
    f. Engineering Design of Wellhead Improvements, Controls and Conveyance
2) Phase 2 –Construction
    a. Land Acquisition and Right of Way
    b. Construction of Wellhead Improvements, Controls and Pipeline
    c. Water Right Permit Amendments
    d. Beneficial Use Survey

Cost Estimate

Hydrogeologic Feasibility Study parts a, c, d and e	$322,306
Design and Construction parts c and d	$20,000
Design and Construction parts f, a and b	$1,430,000

4.2.1.6 Long Term Options

Over the long term, the City will need to continue to evaluate options to develop interconnections with regional water suppliers. The City may also consider optimizing long-term production from the CRB aquifer by developing an Aquifer Storage and Recovery (ASR) Program. This program would allow the City to store excess winter water from the spring water right certificates into the CRB aquifer wells in and around the City Center (Behrman Well, Well #2, and potentially the Quail Valley Well and the proposed Southwest Wellfield).

4.2.1.7 Tualatin Valley Irrigation District (TVID)

The City has considered purchasing non-potable water from TVID in order to supply large-volume water customers with an alternative source of irrigation water. This arrangement has the potential to significantly reduce potable water use by these customers and thus provide "additional" potable water to meet residential water needs.

A purchase agreement with TVID would need to be accompanied by concurrent water rights amendments to allow use of TVID water to irrigate land serviced by the City, as well as a modest investment in infrastructure to allow delivery of non-potable water to large-volume irrigation users. Currently, there is a moratorium on new service agreements with TVID that is expected to last until the year 2015. However, Banks may begin planning and negotiations with TVID at this time in order to be ready to take advantage of a potential TVID connection when the opportunity arises.

The scope of work to pursue this option would include the following:

1) Phase 1 - Engineering Feasibility Study
    a. Water Right Consultation with TVID
    b. Access Agreement and Right of Way Feasibility
    c. Analysis and Reporting
    d. Land Acquisition and Right of Way
    e. Water Right Permit Amendments
    f. Project Design
2) Phase 2 - Construction of pipeline and other improvements

Cost Estimate

This option was not pursued at this time as there is a moratorium on new services. When the moratorium is lifted the requirements of this option should be discussed with TVID.

4.2.1.8 Interconnection with other Providers

Developing interties with neighboring water providers has the potential to provide a significant source of water to the City, as well as a reliable redundant supply in the event of a water supply failure from one or more of the system's major water sources. Intertie construction and purchasing water from outside sources is also the most expensive option for developing additional/redundant supply. Interties with the City of Forest Grove, the City of North Plains, the Joint Water Commission and/or the Tualatin Valley Water District may be considered. It is suggested that an intergovernmental agreement with one of these water providers be drafted before pipeline development is conducted.

The scope of work to pursue this option would include the following:

1) Phase 1 - Feasibility Study
    a. Consultation with potential Providers
    b. Determination of water quantity available
    c. Evaluation of cost (capital, connection fee, user rates)
    d. Develop an Intergovernmental Agreement
    e. Project Design

2) Phase 2 - Construction of pipeline and other improvements

Cost Estimate

Before estimates can be developed the City will need to begin discussions with potential providers. Depending upon the requirements of the potential provider, a feasibility study may range from $10,000 to $30,000.

Design and construction would include a pump station and at least 5.3 miles of transmission pipe. $4,000,000

Additional cost would include a connection fee that would be negotiated between providers.

4.2.1.9 Aquifer Storage and Recovery (ASR)

An ASR system requires an alternate source of water supply to recharge a subsurface reservoir. Banks has one near-term option and one long-term option for alternate water sources that could be used to recharge the CRB aquifer near the town center.

- Near-Term Source: Recovered water from the Water Treatment Plant or the groundwater developed under the Sellers Road well field concept could be used to develop an ASR project at the Behrman Well or Well #2.
- Long-Term Source: Water supply contracts with regional suppliers may include provisions for off-peak water delivery at a significantly reduced cost per gallon. If this is the case, the City may consider storing winter water purchased through such a contract for an ASR system utilizing Well #2 or the Behrman Well.

ASR is a water management approach that typically uses wells to store treated drinking water in a suitable aquifer system, and recovers that water through the same wells at a later date. Aquifer storage displaces the native groundwater and effectively creates an underground reservoir of water than can be recovered for a wide variety of applications. ASR systems have been designed and operated to meet a wide range of objectives at sites with many different physical and hydrological conditions and water sources. The number of active ASR projects in Oregon has increased from zero in 1995 to 10 in 2008, with at least 20 wells in use or in development.

ASR systems are usually operated to take advantage of available excess water volume, either from water treatment plant capacity during winter months or another acceptable source, to store treated water, and recover that water through wells during the summer months to help meet peak demands. Recovered water quality in most ASR systems generally reflects the source water, although some mixing with native groundwater does occur. In many cases, ASR systems can be designed to meet a primary objective as well as to provide several secondary benefits. In addition to providing a source option, the potential benefits of a Banks ASR system include:

- Taking advantage of "off-season" lower winter rates if available from a regional water provider under a conservation rate structure. This would allow the purchase and storage of cheaper water in the winter for later use at peak summer demand.
- Storage capacity can be added at locations within the water supply system where demand is increasing, where there is a benefit to enhancing chlorine residuals, or where there is a benefit to delivering water directly to different pressure zones;
- Creation of environmental benefits through reduction of stress on water-related habitats during drought periods.

An ASR well will deliver water at the rate associated with any appropriately designed water supply well. The target aquifer systems are usually confined systems both to provide a groundwater protection benefit, and to limit the potential for the interaction with nearby shallow domestic wells and surface water features. Consequently, Banks-area ASR wells would have the same location targets and potential yields as the groundwater supply well options. Based on the evaluation of the Behrman Well, Well # 2 and the Quail Valley Well, the most likely yield of any new ASR well would be near 300 gpm. The well log review indicates that where wells encounter greater thickness of higher permeability basalts, well yields are substantially higher.

Because recharge rates in ASR wells are typically held to 75% of the production rates, a 300-gpm production well would recharge in the vicinity of 225 gpm, if the excess water was available. Over a 6-month recharge period, approximately 58 MG would be stored in the subsurface. If 90% of this volume were recovered to the system with a single well, it would

require approximately four months of pumping to recover. This option would require the development of a water system intertie with a neighboring community or regional water provider to acquire source water sufficient to beneficially operate the system.

Groundwater rights are not required for ASR well operations. The permitting process requires a valid water right to appropriate the source water for storage, and an assessment of the potential for impacts to nearby groundwater users. Because ASR systems typically operate in a fashion that has no net impact on the annual groundwater budget, it is more likely that an ASR system would be viewed as having less impact on nearby surface water and groundwater supplies than a groundwater extraction wellfield. Consequently, ASR permitting is likely to be less costly, require less stringent mitigation planning, and has a greater chance of success than obtaining a new groundwater right.

In order to evaluate the feasibility of developing an ASR operation to integrate with The City of Banks' water supply system, the city should evaluate the following conditions:

- Identify whether ASR development costs at Well #2 are higher or lower than the costs to build onsite reservoirs.
- Evaluate whether there are portions of the service area that could benefit from additional pressure, chlorine residual, or supply in addition to the benefit of having an additional source in the event of WTP shutdown or loss of another water supply sources due to some other system failure.

The scope of work to develop the ASR options would be:

Phase 1 - ASR Feasibility Study

a. Pre-application consultation with Oregon Water Resources
b. ASR Hydrogeological Feasibility Study, Monitoring Well Network and Report
c. Pilot Test Work Plan Document
d. Permit Application and three Additional OWRD Meetings

Phase 2 – Design and Construction

a. Design of wellhead
b. Construction of Wellhead
c. First Year Pilot Testing and Reporting

Cost Estimate

ASR Feasibility Study	$132,500
Design and Construction parts a and b	$810,000
Design and Construction parts c	$125,000

Additional source is required for this option to work. Therefore, this option would need to be combined with one of the other source options, which significantly increases the cost of this option.

4.3 Storage

The Banks water system currently contains four storage facilities: the High Zone Reservoir, the North Star Reservoir, and Carsten Reservoirs 1 and 2. The North Star Reservoir provides storage volume for the High Zone customers and the Main Zone Customers. Carsten Reservoirs No. 1 and 2 provide storage volume for the Main Zone. Water storage for the High

Zone is provided solely by the high level storage, while the Main Zone is served both by the high level storage and the entirety of the Carsten Reservoirs.

Tables 4-2 and 4-3 illustrate the storage requirements and additional storage needs on a yearly basis throughout the planning period for the Main Zone, and the storage requirements in the High Zone for both current and 2028 conditions, respectively. The analysis conducted includes an effective volume consideration for the existing storage as well as recommended storage. Each reservoir is assumed to have an effective tank volume of 90 percent of its total capacity.

Table 4-2: Banks Water System Service Area Storage - Main Zone

YEAR	ADD (gpm) [a]	ADD (mgd)	MDD (gpm) [a]	MDD (mgd)	Required Storage (MG) [b] [e]	Existing Storage (MG) [c]	Additional Capacity Required (MG) [d]
2008	182	0.26	420	0.61	1.33	1.38	(0.05)
2009	197	0.28	453	0.65	1.39	1.38	0.01
2010	211	0.30	486	0.70	1.45	1.38	0.07
2011	225	0.32	519	0.75	1.50	1.38	0.12
2012	240	0.34	552	0.79	1.56	1.38	0.18
2013	254	0.37	585	0.84	1.64	1.38	0.26
2014	268	0.39	618	0.89	1.70	1.38	0.32
2015	282	0.41	650	0.94	1.75	1.38	0.37
2016	297	0.43	683	0.98	1.81	1.38	0.43
2017	311	0.45	716	1.03	1.87	1.38	0.49
2018	325	0.47	749	1.08	1.93	1.38	0.55
2019	340	0.49	782	1.13	1.98	1.38	0.60
2020	354	0.51	815	1.17	2.04	1.38	0.66
2021	368	0.53	847	1.22	2.10	1.38	0.72
2022	382	0.55	880	1.27	2.15	1.38	0.77
2023	397	0.57	913	1.32	2.21	1.38	0.83
2024	412	0.59	948	1.37	2.27	1.38	0.89
2025	412	0.59	948	1.37	2.27	1.38	0.89
2026	412	0.59	948	1.37	2.27	1.38	0.89
2027	412	0.59	948	1.37	2.27	1.38	0.89
2028	412	0.59	948	1.37	2.27	1.38	0.89

NOTES

(a) Main Zone ADD and MDD are based on the difference between the Total System ADD and the High Zone ADD.
(b) The required storage volume is equal to: (the sum of 25% of the MDD; twice the ADD; and the Commercial Fire Flow) * 1.1
(c) The existing storage in the Main Zone accounts for the full Carsten Reservoirs No. 1 and 2 volumes less 10% to account for only 90% effective volume in the reservoir.
(d) The additional storage volume needed is the difference between the required storage and the existing storage available.
(e) Commercial/Industrial Fire Flow = 3,000 gpm for 3 hours.

The Main Zone will experience population growth and increased water demand as the City expands its limits and connects more services to the water system, creating a need for greater volumes of stored water. Currently, the Main Zone is served by 1.5 MG of storage volume at the Carsten Reservoir site, of which the full volume is all available for use during a fire or other type of emergency. Also available to the Main Zone is 180 gpm of flow that can be withdrawn from the North Star Reservoir via the 6-inch-diameter transmission main through the PSV/PRV and to the Main Zone to recharge to water level in the Carsten Reservoirs as they are drawn down to address the storage requirement. This value was calculated based on the upstream setting of the PSV/PRV, the operating water surface elevation of the North Star Reservoir, and the flow characteristics of the 6-inch-diameter transmission pipeline. Water flowing in the transmission pipeline at 180 gpm for three hours results in 0.03 MG of High Zone water storage available to the Main Zone.

As shown in Table 4-2, the Main Zone will need an additional 1.0 MG (rounded) of storage by the year 2024 when population buildout is expected to occur. The new storage reservoir for the Main Zone is listed in the capital Improvements section as Project 5, and is shown on Figure 4-1. Once the location of the population growth becomes clear, the proposed storage facility will be sited and designed strategically in order to supply water within the desired pressure range to the new water customers.

Table 4-3: Banks Water System Service Area Storage - High Zone

YEAR	ADD (gpm) [a]	ADD (mgd)	MDD (gpm) [a]	MDD (mgd)	Required Storage (MG) [b], [e]	Existing Storage (MG) [c]	Additional Capacity Required (MG) [d]
2008	16.0	0.02	35.9	0.05	0.26	0.06	0.20
2028	16.0	0.02	35.9	0.05	0.26	0.20	0.06

(a) High Zone ADD & MDD are based on percentage of total system demands that correspond to the number of connections in the High Zone.
(b) The required storage volume is equal to: (the sum of: 25% of the MDD; twice the ADD; and the Residential Fire Flow) * 1.1.
(c) The existing storage in the High Zone for 2008 accounts for the North Star Reservoir alone less 10% to account for 90% effective volume in the reservoir. The existing storage in the High Zone for 2028 accounts for the High Zone Reservoir alone less 10%.
(d) The additional storage volume needed based on the criteria in (a) is the difference between the required storage and the existing storage available.
(e) Rural Residential Fire Flow = 1,500 gpm for 2 hours.

As shown in Table 4-3, the values for ADD and MDD are not projected to change during the planning period as no more service connections within the High Zone are anticipated. The High Zone is currently served only by North Star Reservoir, a total of 0.06 MG of stored water. This is because all treated water has to flow through North Star to achieve chlorine contact time. Once North Star Reservoir is taken offline, the storage available to the High Zone will be 0.20 MG, which is the capacity of the High Zone reservoir. The proposed use of the High Zone Reservoir as a clear well will entail additional chlorine contact time before the first customer, and the availability of its water storage capacity.

Based on the industry-standard criteria used to generate Table 4-3, the High Zone has insufficient storage to accommodate the anticipated demand throughout the 20-year planning

period. The 1998 Water System Master Plan Update recommended taking North Star offline and building a new 0.30-MG reservoir at the SSFP site. However, a 0.22-MG tank was built, resulting in a storage deficiency.

After further consideration, we deem that the apparent lack of storage volume in the High Zone is not expected to harmfully impact the water system. A new storage facility that parallels the High Zone Reservoir (with the same overflow elevation) may eventually benefit the system, but this Master Plan recommends taking North Star offline, consolidating the disinfection and treatment, and then monitoring the system to ensure that the system is operating effectively without the additional 0.06 MG of storage that falls out of Table 4-3.

Concurrent with the removal of North Star from the flow path of treated water, the gaseous chlorination facilities used for disinfection at the reservoir site will be removed for health and safety purposes. The new disinfection facility at the SSFP is listed in the Capital Improvements section as Project 3, and is shown on Figure 4-1. Once the tank is removed from service, the total storage available to the High Zone from the High Zone Reservoir will be approximately 0.20-MG.

4.4 Service Areas (Pressure Zones)

By operating the High Zone off of the High Zone Reservoir overflow elevation, the pressure in the high zone transmission main line will significantly increase. As a result, a new PRV station will need to be added to the transmission line. The new PRV will reconfigure the existing pressure zone layout, and create another pressure zone in between the High and Main Zones. The recommended placement of the PRV is at the intersection of Sellers and Woolen Rds, just upstream of the 2-inch service line that tees off Sellers Rd. onto Woolen Rd. The new zone will be referred to as the Intermediate Zone,

In addition to a PRV station,all the services in the high zone will need review to conclude whether they have individual PRVs. If they do not have individual PRVs, and have excessive pressure (after the decommissioning of North Star), then they will need to be installed. This is included in the opinion of probable cost for the SSFP upgrades project. Also included is the estimated cost to furnish the new PRV Station. These improvements are all included in the Capital Improvements section with Project 3.

Service meters are best suited to be placed indoors (such as the garage) to preserve the longevity and accuracy. However, for the purposes of this report, each new individual PRV will be assumed to be housed in a new vault outside.

4.5 Pipeline and Fire Flow Analysis

4.5.1 Distribution System

Hydraulic modeling of Banks' transmission and distribution system was completed. There are 16 nodes within the distribution system that cannot deliver the fire flow required by the land use zoning category (see Section 4.3 for requirements) without exceeding one or both of the criteria shown in Section 3. The applicable criteria include a critical pipe velocity of 10 fps and a residual system pressure of 20 psi. The pipe velocity is a "rule of thumb". The higher the velocity, the higher the headloss through friction, which requires more energy to overcome. It is generally considered that it is more cost effective to increase the pipe size rather than increase the pump horsepower when velocities are above 10 fps. The system pressure is mandated by the OAR Chapter 333. However, six of these nodes are dead-end pipes where no fire hydrant is

located. Figure 4-2 shows all node locations within City limits where the required fire flow is unavailable. Table 4-4 below summarizes the nodes serving nearby fire hydrants that do not meet all of the fire flow requirements.

Table 4-4: Banks Water System Modeling – Existing System Fire Flow Deficiencies

Location	Required Fire Flowrate (gpm) [a]	Flowrate at Critical Velocity (gpm) [b]	Modeled Maximum Fire Flowrate (gpm) [c]
Intersection of Market St. and Commerce St.	1,000	880	2,080
Intersection of Depot St. and Commerce St.	1,000	880	1,850
End of 8-inch line in Lumber Yard along Railroad	3,000	1,560	2,640
Intersection of Park St. and Woodman Ave.	1,000	880	1,170
Intersection of Woodman Ave. and Parmley Ave.	1,000	880	1,320
Intersection of Parmley Ave. and Wilkes St.	1,000	880	1,490
End of 6-inch line on Wilkes St.	1,000	880	1,200
End of 6-inch line in Sunset Park	3,000	880	1,900
End of 6-inch line at shopping center south of Oak Way	3,000	880	2,100

Notes:

(a) 1,000 gpm for residential zoning; 3,000 gpm for commercial and industrial zoning.
(b) Flowrate shown occurs when critical velocity in the pipe is reached.
(c) Indicates that critical residual pressure in the system is reached (20psi).
(d) Deemed borderline insufficient.

Each node where fire flow is unavailable presents a possible public safety hazard. Each dead end line presents both a potential water quality issue and a maintenance item as they need to be periodically flushed. The looping of these lines will address this concern, as well as bolstering the hydraulic capacity of the distribution network as a whole. The location and description of these lines are as follows:

A. Intersection of Woodman Ave. and Park St. – Upsize the existing 2-inch Park St. line (620 feet) to 8-inch and connecting it to the 6-inch line on Woodman Ave with approximately 30 feet of 8-inch pipe. Due to the fact that fire flows in this area are all lower than 1,500 gpm, this is recommended for high priority.

B. East of intersection of Woodman Ave. and Parmley Ave. – If adequate road or shoulder space is available to construct this addition to the distribution system, connect the dead-end line east of Woodman Ave. to the 6-inch line at the intersection with approximately 180 feet of 6-inch pipe. This project would bolster fire flow at the intersection of Woodman Ave. and Parmley Ave. and eliminate a dead-end to create more looping within the system. This is recommended for high priority.

C. End of 6-inch line on Wilkes St. – If an easement to construct a pipeline is available, install approximately 250 feet of 8-inch pipe and connect the 6-inch dead-end to the 12-inch main along the Railroad Right-of-way. This project would bolster fire flow at the

hydrant on Wilkes St., and eliminate a dead-end to create more looping within the system. This is recommended for high priority.

D. Commerce St. from Market St. to Sunset Ave. – Install approximately 825 feet of 8-inch line along Commerce Ave., looping the 6-inch dead-end lines on Market St. and Depot St. with the 8-inch line on Sunset Ave. This project would eliminate two dead-ends and create more looping within the system, and is recommended for medium priority.

E. West end of Jarvis Pl. to west end of Elmhurst Ct. – Loop four dead-end lines and cross the 12-inch line along Trellis Way with approximately 680 feet of 8-inch pipe. This project would eliminate four maintenance areas in the distribution system, and is recommended for medium priority.

F. West from Highway 47 on Cedar Canyon Rd. – Upgrade the 2-inch line along Cedar Canyon Rd. that crosses a bridge over West Fork Dairy Creek (400 feet of 2-inch line on west side of Main St.) to 6-inch pipe until the point where it splits off into two 1.5-inch lines serving the western-most customers on Cedar Canyon Rd. This project would bolster the integrity of the service main that crosses the Creek, and is recommended for medium priority.

   If the UGB is expanded to the west in the vicinity of Cedar Canyon Road, then this pipe should be upgraded to a 12-inch back to the 14-inch pipe on Highway 47.

G. End of 8-inch line in Lumber Yard along railroad – Connect to the 12-inch main due east with approximately 480 feet of 8-inch pipe. Due to the fact that other hydrants are available at the lumber yard and construction may be difficult due to operations at the facility, this is recommended for low priority.

H. End of 6-inch line in Sunset Park – In order to loop this dead-end pipe to the 12-inch main along Highway 47 (Main St.), 180 feet of 8-inch pipe is recommended. This construction would need to be bored underneath Highway 47, which is expensive. Due to the fact that another hydrant is available on Highway 47 across from the park and the difficulties involved with construction, this is recommended for low priority.

I. End of 6-inch line at shopping center south of Oak Way – Loop two dead-end lines by connecting the 4-inch to the 6-inch pipe by crossing the shopping mall property with approximately 300 feet of 6-inch pipe. This addition would bolster fire flow at the nearby hydrant and eliminate two maintenance areas in the distribution system. However, as another hydrant is located nearby on a 10-inch line on Oak Way, this project is recommended for low priority.

In each location that fire flow is unavailable, the proposed alteration to the distribution system (pipe upgrade or system looping) has been added to the model for possible implementation.

Figure 4-3 shows all recommended distribution system changes to address deficiencies in the existing distribution system. Table 4-5 below summarizes the nodes serving nearby fire hydrants that still do not meet all of the fire flow requirements.

Table 4-5: Banks Water System Modeling – Future System Fire Flow Deficiencies

Location	Required Fire Flowrate (gpm) [a]	Flowrate at Critical Velocity (gpm) [b]	Modeled Maximum Fire Flowrate (gpm) [c]
End of 8-inch line in Lumber Yard along Railroad	3,000	2,680	4,300
End of 6-inch line in Sunset Park	3,000	1,920	4,400
End of 6-inch line at shopping center south of Oak Way	3,000	1,340	2,880

Notes:

(a) 3000 gpm for commercial and industrial zoning.
(b) Flowrate shown occurs when critical velocity in the pipe is reached.
(c) Indicates that critical residual pressure in the system is reached.

As can be seen in Table 4-5, after the proposed changes the system will still not receive fire flow and meet the critical velocity or critical residual pressure criteria at every fire hydrant in areas zoned for commercial or industrial use. However, as one can see from a comparison of Tables 4-4 and 4-5, the proposed changes do enhance the system's ability to respond to fire flow demands. Also, the number of dead-end lines in the distribution system will decrease from 21 to 7.

4.5.2 Expansion of Distribution System in Response to Growth

As previously discussed in Section 2, Banks will extend its City Limits and UGB in order to increase its population. The population growth must be met with the extension of the utilities Banks provides to its residents, including potable water. Although the geographical direction of the expansion is unknown, hydraulic modeling of Banks' water system pertaining to expansion in any one direction has been performed. The modeling looked at the adequacy of the existing distribution system to deliver the required flowrate (1,000 gpm fire flow for residential areas plus the increase in maximum daily demand presented in Table 2-3) to the new pipelines. Table 4-6 presents the modeling results, and Figure 4-4 shows the locations of the new pipelines for each "Buildout Scenario". It is important to note that the demands placed at the new nodes (dots of each assigned color represent the locations where the total demands were placed) are conservative in that the new nodes should not see the entire difference between 2008 and 2028 MDD plus the residential fire flow.

Table 4-6: Banks Water System Modeling – City Expansion Scenarios

Buildout Scenario	Color on Figure 4-4	Required Flowrate (gpm) [b]	Minimum Modeled Flowrate (gpm) [c]
Northeast [a]	Red	1,528	n/a
Northwest	Yellow	1,264	3,230
West	Green	1,264	4,350
South	Orange	1,264	4,070
East	Magenta	1,264	4,000
East Banks Rd. [a]	Cyan	1,528	n/a

Notes:

(a) Due to the existing ground surface elevation where demands were placed, the distribution system cannot deliver the required flowrate to the hypothetical nodes without residual system pressure dropping below 20 psi. A new pressure zone would be required.
(b) The required flowrate is the total demand assigned to any new node. This includes the 1,000 gpm residential fire flow and the difference between the 2008 and 2028 MDD.
(c) Flowrate modeled at any new node when residual pressure reaches 20 psi.

As can be seen from Table 4-6, most "Buildout Scenarios" can be accommodated by the existing distribution network. However, if growth was to occur either to the northeast (on the hill north of the Carsten Reservoir site) or east along Banks Rd (also up a hill), then the existing network cannot support the growth without the addition of a booster pump station. The pump stations would be designed to transmit treated water from the distribution system to the new development without residual system pressures dropping below 20 psi.

In summary, it has been verified that the distribution system can be expanded in any direction that the UGB is expanded. This expansion should connect to the main system loop within the City wherever possible, and depending on the elevation of the land that is developed, may need a booster pump station to serve a new pressure zone.

As development occurs in the expanded UGB the City will need to insure that the pipe includes a 12-inch loop tied into the existing 12 and 14-inch distribution pipe.

4.5.3 Transmission Pipeline

The 6-inch tar-wrapped steel transmission pipeline carrying treated and disinfected water from the North Star Reservoir to the City has reached the end of its service life and is believed to contribute heavily to Banks' large unaccounted-for water volume. The transmission main should be abandoned following the entire 3.2-mile length. This includes a 0.3-mile stretch of 6-inch PVC pipe from the SSFP to North Star, and 2.9 miles of steel pipe traveling south from North Star to Sellers Rd., and following Sellers Rd. through the PSV/PRV and into the Main Zone. A 10-inch line should replace the existing line extending to the 14-inch line at Main St. (Hwy 47).

Another option is to install parallel lines, with one acting as a transmission main to the Main Zone, and the other acting as a distribution main through the High Zone and extending to the location of the PSV/PRV. The abandonment of the specialty valve would accompany this alternative option, which would cost substantially more than the option of upgrading and replacing the pipeline along the existing alignment. Therefore, the parallel line option has been deemed cost-prohibitive and is not being evaluated further.

The recommended option is the replacement of the 6-inch transmission main with a single 10-inch main along the same alignment. The existing 4-inch PSV/PRV is currently undersized, although it functions properly as a pressure sustainer for the High Zone customers and a pressure reducer for the Main Zone customers. When the transmission line is replaced, a new PSV/PRV station should replace the existing one. The expected size of this station is a 6-inch main valve setup with a 2-inch bypass line for existing flows from the SSFP. If additional source capacity is targeted in the area north of the city and the Sellers Rd. transmission line will transmit substantially higher flows, then an 8-inch main PRV setup with a 2-inch bypass line is recommended. This issue will need to be addressed during planning for detailed design of a new transmission pipeline.

Once the transmission line is replaced, and the existing line abandoned, the system should experience lower leakage loss and higher transmission capacity. Coupled with the abandonment of the North Star Reservoir, the customers in both pressure zones will continue to experience adequate system pressures so long as the system is designed correctly. The replacement of the treated water transmission pipeline and PSV/PRV station is listed in the Capital Improvements section as Project 2, and is shown on Figure 4-1.

Figure 4-5, a future system schematic hydraulic profile, shows the newly created pressure zone, along with the other proposed changes to the Banks water system.

4.5.4 Leak Detection Survey

In addition to the 3.2-mile transmission main that is believed to significantly contribute to the substantial water loss in the system, it is feasible that other pipelines in Banks also leak treated water. Due to the uncertainty regarding the exact location of water leakage, a detailed Leak Detection Study should be performed that covers all pipelines owned and operated by the Banks water utility (both distribution and transmission). This project is listed in the Capital Improvements section as Project 10.

4.6 Slow Sand Filter Treatment Plant

The SSFP treats incoming water from the Green Mountain Springs to the necessary water quality standards (pre-disinfection) outlined in Section 5. The plant is equipped with the hydraulic capacity necessary to treat the highest flows it receives, and all components of the treatment system are fit for continued use.

Due to the somewhat isolated location of the SSFP, backup onsite power generation is recommended. A generator could be sized to supply power via onsite fuel storage to all the components of the treatment plant, creating a redundant source of power generation that would allow for the system to continue fully operating during a spontaneous power outage.

4.7 Disinfection

Although the filter basins and existing equipment are fit for continued service, the SSFP site can be upgraded by outfitting the outlet portion of the plant with disinfection capabilities, and utilizing the High Zone Reservoir as a clear well. The chlorine gas disinfection system and equipment currently utilized at the North Star Reservoir site could then either be abandoned or left as a backup. Abandonment is recommended as the human and environmental health hazard a chlorine gas leak creates can therefore be eradicated.

Disinfection capabilities should be consolidated with treatment at the SSFP site. The proposed low-impact chemical solution is the addition of sodium hypochlorite. The sodium hypochlorite needed for the filter plant effluent could be generated onsite from a brine solution, electricity, and water. Having onsite generation capabilities, as opposed to purchasing a solution to be delivered, creates a situation where Banks would eliminate the need to rely on deliveries during the winter months, and the investment made by purchasing the equipment would be paid off by not needing to purchase gaseous chlorine cylinders or sodium hypochlorite solution.

Two options exist for locating the sodium hypochlorite generation system. A new building could be constructed to house the required system components, as shown in Figure 4-6, or the equipment could be placed in the existing filter gallery so long as the necessary space is available. The new disinfection facility at the SSFP is listed in the Capital Improvements section as Project 3, and is shown on Figure 4-1.

A new disinfection facility at the BW site is also recommended to disinfect the groundwater extracted from the existing well and Well No. 2. This facility would replace the existing chlorine gas storage facility that is piped into the groundwater before it is pumped into Carsten Reservoir No. 1. This project, coupled with providing onsite backup power generation for the electrical equipment at the BW site, is listed in the Capital Improvements section as Project 4, and is shown on Figure 4-1.

4.8 System Controls and Telemetry

The existing system controls utilized by Banks include altitude valves, the PSV/PRV, and automatic pump start-up based on the Carsten Reservoir levels. All other system parameters, such as SSFP levels and outflows, reservoir levels, Behrman Well outflows, and disinfection quantities used are either recorded manually or not recorded at all. A comprehensive system that remotely monitors all the desired system parameters and transmits them to a central location via radio waves would be beneficial for system oversight.

A system of antennas, coupled with the necessary monitoring equipment (instrumentation), would be installed at each facility. Radio waves would transmit signals to a central computer and software system in the new Public Works building. All system parameters would be recorded, and an alarm system could be installed in conjunction with the monitoring system to set off local alarms notifying personnel of the problem. Remote alarms could also be installed to notify other buildings.

In order to provide a comprehensive monitoring setup for the Banks water system, the following base equipment would be required:

- A Remote Terminal Unit (RTU), Programmable Logic Controller (PLC), and required level instrumentation at the Behrman Well site and the Carsten Reservoir site;
- An RTU, PLC, instrumentation, computer network, and software program at the SSFP site; and
- A computer and software program at the centrally located Public Works Building.

4.9 Site Security and Chemical Safety

The security of each individual site that makes up the Banks water system is essential. Ensuring that the raw and treated water, transmission systems, and capital infrastructure are all

preserved is integral to the success of the water utility, and the safety of both customers and operators.

Three levels of potential security hazards exist: vandalism, theft, and terrorism. Although the likelihood of terrorist activity is small, it does not hurt to plan ahead for attacks on civilians through the water system. However, the more common security breaches at water utility infrastructure are through vandalism and theft. To protect from these threats, three levels of security are available: deterrents, activity detection through advanced technology, and onsite security personnel. Again, it is unreasonable to assume that full time security staff can be hired to protect pieces of the water system. At the same time, by using motion detection and live camera feed you are not providing means of stopping the vandalism or attack, but rather making provisions to be aware of the security breach when it occurs.

If a biological attack was to occur on the water system, it behooves the water utility to be prepared with an Emergency Action Plan (EAP) to address the situation. The EAP typically includes personal safety equipment, sample kits, and procedures to follow if this type of activity occurs. The EAP costs approximately $5,000 to develop, with the additional cost to train public works employees as to the elements of the plan. The next level of planning for an elevated attack is to conduct a Vulnerability Assessment (VA) on the water system as a whole. This is a comprehensive document that attempts to pinpoint the locations in the system where it could be amended in order to deter and/or eliminate potential attacks.

The simplest method to deter illegal trespassing, theft, and vandalism is to install fences around the perimeter of each facility. Kennedy/Jenks typically recommends 6-foot tall chain-link fencing with 3-strand barb wire over the top of a 90 degree bend in the fencing. This makes it extremely difficult to accomplish unauthorized access to facilities. The recommended safety installations at the various facilities in the water system are as follows:

- Green Mountain Springs Intake – Fencing, lock, and signage.
- SSFP and High Zone Reservoir – Lighting, fencing, locks, and motion detection. The reservoir should also have locks on hatches and ladder cages, and also a screen on the vent(s).
- PSV/PRV – Lock on the hatch to avoid tampering and vandalism.
- Carsten Reservoir Site – Fencing with locks around the perimeter and signage. Also locks on hatches and ladder cages, and screen on vents.
- Behrman Well – Fencing with locks, signage, and intrusion detection,

Chemical security is a major concern. Chlorine gas is a hazardous material that, if released to the atmosphere, can cause damage to both humans and the environment. Currently, two distinct chlorine gas sites are used in the Banks water system for disinfection: the North Star Reservoir and the Behrman Well. State regulations stipulate that no more than 2,500 pounds of chlorine gas can be stored at any one site, which is greater than the chemical storage provided by Banks. The general trend in the water industry shows the majority of water purveyors going away from chlorine gas storage and addition, and utilizing onsite chlorine generation.

The improvements recommended in this Master Plan include the decommissioning of both of these disinfection systems in favor of onsite chlorine production through generation of sodium hypochlorite. If onsite chlorine generation is provided for through the mixture of salt, water, and electricity, then there will be no more need for chlorine gas and the potential safety hazard will

be removed. If the chlorine gas system remains in service, then a chlorine detection unit, gas scrubber system, and remote alarm system signaling the leak to City Hall is recommended for installation at each disinfection location. However, these alternative system upgrades are not listed in the Capital Improvement Program.

Oregon DHS does not mandate any specific security precautions. Therefore, the underlying factor in the discussion of site security is to find solutions that create a comfortable situation for Banks. The level of security at each site depends on the preference of the owner and operators.

4.10 Water Service Meter Reading

Customer water consumption is read manually on a monthly basis by Public Works employees. Another option exists for reading meters: Automatic meter reading (AMR).

AMR is a beneficial tool that can save time, money, and mistakes for a water purveyor like Banks. Once the specialty meter and hardware are purchased and in place, manual reading of meters will no longer be required except for verification that the automatic process is operating correctly. The meter will be equipped with a module that is capable of transmitting signals via cell phone, telephone lines, or Ethernet.

Two options exist for the implementation of an AMR system, with increasing degrees of capital cost and decreasing degrees of operator requirements. The first system is known as "Radio-Read" (Radio), while the second available system is referred to as "Fixed Network" (Fixed).

The Radio system involves installing a new meter and module at each existing and future connection, and purchasing a piece of handheld equipment which reads the radio signal up to a certain distance. The module constantly reads the flow volume recorded by the meter and transmits the information via airwaves, which is picked up by the reader device whenever it is active and within range. To read the meters, an operator drives by each meter once a month with the reader unit onboard. The reader is then brought in and connected to a central computer, which uploads the recorded flow data to proprietary software and interfaces with the billing software.

The Fixed system involves installing a new meter and module at each existing and future connection, as well as various "Collector" units that are mounted in strategic locations around the water system. The module at each meter reads the flow volume recorded by the meter twice a day, and transmits the information twice a day to the nearest collector. The local collector then transmits the recorded data to a central "head-end" unit that is located at Public Works headquarters. The central computer contains the software necessary to upload the recorded flow data, and interface with the billing software.

Two options exist for the execution of an AMR system. The first is to install the specialty meters at existing connections and new water services, and manage the software at the Public Works Building where the new equipment will be used in conjunction with customer billing and monitoring of the quantity of water flowing in the system. The second is to contract out the monthly labor, where an external agency would be responsible for the meter readings and providing the results to the City based on an agreement. It is not recommended that Banks contracts out this work, as it is cost-prohibitive for medium sized water systems, and either level of technology is user friendly so long as good training regimens occur from the onset of the system. Also, if the work is kept in-house, large levels of reporting flexibility are available to further monitor the activity throughout the water system.

Amendment #1

4.11 Water System Flow Control

Refer to section 2 and 3 of Amendment #1 found in Appendix C.

Section 5: Regulatory Review

5.1 Introduction

This section contains an overview of recent regulatory evaluations pertaining to the Banks water system, as well as a comprehensive discussion outlining the general regulatory requirements for water utilities on both the state and federal levels.

5.2 Recent Regulatory Evaluations

A Sanitary Survey was conducted on the Banks water system by the Public Health Division of the Oregon Department of Human Services (DHS) in April of 2008. The Survey mandated that, among other things, a Tracer Study be performed to calculate the product of the amount of chlorine contact time and free chlorine residual concentration, or concentration times time (CT), the water received before the first water service.

5.2.1 Sanitary Survey

The Drinking Water Program (DWP) of the DHS conducted the Sanitary Survey of the Banks Water Department in April of 2008, with the results and noted deficiencies being submitted to the City in the form of a letter on 12 May 2008. The DWP required that a corrective action plan be submitted within 45 days of the dated letter detailing out how and when the deficiencies will be addressed. A summary of the deficiencies noted as part of the Sanitary Survey is below:

- Violation of the Surface Water Treatment Rules as a result of not calculating CT values correctly. Tier 2 public notice issued to all customers every three months until accurate and acceptable CT values have been determined.
- Conduct a Tracer Study for the North Star Reservoir. DHS' circuit riders, HBH Consulting Engineers, is available to perform the study.
- The residual chlorine concentration must be measured and recorded at least three times per day at the outlet of the North Star tank. Maintain residual disinfectant concentration of 0.2 mg/L.
- The CT calculation is being done incorrectly. The method needs to be changed to follow the correct steps, and recorded on the Surface Water Quality Data Form each day.
- In order to create a physical separation between untreated and treated surface water, physically remove all bypasses around the North Star reservoir. This includes a valve and valve bypass.
- Install a turbidimeter on the combined filter effluent line as close to the filter effluent as possible, and record turbidity measurements daily.
- Calibrate all turbidimeters four times per year (quarterly), following manufacturer's recommendations.

- A Radiological Test must be performed at the outlet of the Behrman Well for two consecutive quarters, and two more consecutive quarters if radiologicals are detected in the groundwater.

- Perform an asbestos test for treated water. Collect water samples from the distribution system where Asbestos-Cement pipes are in place.

Banks is in the process of complying with all findings of the survey. The DWP plans to conduct a Sanitary Survey once every three years to ensure the water system is supplying safe drinking water to the public.

5.2.2 Tracer Study

A Disinfection Contact Time Tracer Study was performed by HBH Consulting Engineers on 15 May 2008. This study was conducted to comply with the DWP request in the Sanitary Survey, and in accordance with EPA standard methodology.

The study concluded that under the worst-case scenario conditions (when the water has a temperature of 5 degrees Celsius and a pH of less than 7.5) the CT should be 58. The contact time in the Tracer Study was 67 minutes, with a residual concentration of 0.8 mg/L, corresponding to a CT value of 53.6. This results in insufficient contact time for the worst-case scenario. However, the testers note that the temperature of the water is rarely lower than 8 degrees Celsius.

The overall conclusion of the Tracer Study was that when water temperature drops below 10 degrees Celsius, the residual chlorine concentration should be increased to 1.0 mg/L.

Should the North Star Reservoir be abandoned in the future, then the High Zone reservoir can be used as a baffled clearwell to provide ample CT for the water system prior to the first customer.

5.3 Regulatory Requirements

Drinking water quality is regulated by federal law, including the Safe Drinking Water Act (SDWA) and the 1986 amendments to the SDWA, and by State law, including OARs for public water systems. The U.S. Environmental Protection Agency (EPA) and State agencies enforce drinking water regulations. In Oregon, the Oregon Health Division is the primary agency in the enforcement of federal and state regulations for public water systems.

5.3.1 Federal Regulations

The SDWA, and the amendments thereof, provide the minimum treatment requirements for drinking water quality. The states have the opportunity to use these minimum requirements or develop requirements that are more stringent. OARs, developed for the State of Oregon, are the applicable drinking water quality requirements that meet federal regulations. The federal regulatory requirements on the treatment of drinking water are therefore addressed in the discussion on state regulations.

5.3.2 State Regulations

OAR Chapter 333 lists the applicable drinking water quality requirements for all public water systems in Oregon. These rules were developed by the Public Health Division of the Oregon

Department of Human Services and became effective in December 1992. OAR Chapter 333 sets maximum contaminant levels (MCLs) and action levels for various contaminants, outlines treatment requirements and performance standards, covers treatment requirements for corrosion control, provides sampling and analytical requirements, describes public notice guidelines, and presents other requirements related to the construction and operation of WTPs.

5.3.2.1 MCLs and Action Levels

OAR 333-61-020 defines MCLs as the maximum allowable level of a contaminant in water delivered to the users of the public water system and defines action levels as the concentration of lead or copper in water which determines, in some cases, the treatment requirements that a water system is required to complete. The required MCLs and action levels are presented in OAR 333-61-030. MCLs are set for inorganic chemicals, organic chemicals, turbidity, microbiological contaminants, and radioactive substances. Action levels are set for the inorganic chemicals, lead, and copper. The regulations further delineate these levels based on water source. In general, there are two types of sources considered: surface water and groundwater under direct influence of surface water (one type, referred to as surface water in this discussion), and groundwater. As indicated in the following discussion, the treatment requirements are generally much stricter for surface water sources.

MCLs and actions levels for various inorganic chemicals are summarized in Table 23 and apply to both types of water sources.

Table 5-1: MCLs and Action Levels for Inorganic Chemicals

Inorganic Chemical	MCL (mg/l)	Action Level mg/l)
Antimony	0.006	
Arsenic	0.05	
Asbestos	7 MFL[(a)]	
Barium	2	
Cadmium	0.005	
Chromium	0.1	
Copper		1.3
Cyanide	0.2	
Fluoride	4	
Lead		0.015
Mercury	0.002	
Nickel	0.1	
Nitrate (as N)	10	
Nitrite (as N)	1	
Total Nitrate + Nitrite (as N)	10	
Selenium	0.05	
Thallium	0.002	

Notes:

(a) MFL = million fibers per liter > 10 millimeters (mm)
mg/l = milligrams per liter.

Exceeding the MCL for fluoride requires public notice as discussed in OAR 333-61-042. The action levels associated with lead and copper are exceeded if the action level is exceeded by the concentration of the contaminant in more than 10% of the tap water samples collected

during any monitoring period. If either of these action levels is exceeded as described, the treatment requirements for corrosion control must be addressed. These treatment requirements are covered in OAR 333-61-034 and discussed later in this section.

MCLs for organic chemicals apply to both types of water sources and include organics, trihalomethanes (THMs) volatile organics, and toxic organics. The listing of MCLs for organic chemicals is extensive and can be found in OAR 333-61-030 section (2).

The MCL for turbidity applies only to surface water sources. The required MCL for turbidity, measured as Nephlometric Turbidity Units (NTU), is dependent on whether filtration treatment is provided and on the type of different filtration systems.

MCLs for microbiological contaminants apply to both types of water sources, with specific treatment requirements for each. The MCL is based on the presence or absence of total coliform in a sample, as outlined in OAR 333-61-030 section (4). Table 24 outlines the total coliform requirements based on a number of samples.

Table 5-2: Maximum Microbiological Contaminant Levels

System Samples per Month	Maximum Number Total Coliform - Positive Samples per Month
>= 40	not to exceed 5.0 percent
< 40	not to exceed one sample

Radioactive substances are covered in OAR 333-61-030 section (5), and apply to both types of water sources.

OAR 333-61-020 defines secondary contaminants as those contaminants which, at the levels generally found in drinking water, do not present an unreasonable risk to health, but do have adverse effects on the taste, odor, and color of water, produce undesirable staining of pumping fixtures, and/or interfere with treatment processes applied by water suppliers. Table 25 shows the contaminant levels for secondary contaminants.

Table 5-3: Secondary Contaminants

Secondary Contaminant	Contaminant Level
Color	15 color units
Corrosivity	non-corrosive
Foaming agents	0.5 mg/l
pH	6.5 - 8.5
Hardness (as CaCO3)	250 mg/l
Odor	3 threshold odor number
Total Solids	500 mg/l
Aluminum	0.05 - 0.2 mg/l
Chloride	250 mg/l
Copper	1 mg/l
Fluoride	2 mg/l
Iron	0.3 mg/l
Manganese	0.05 mg/l
Silver	0.1 mg/l
Sulfate	250 mg/l
Zinc	5 mg/l

Exceeding the contaminant level for fluoride requires public notice as discussed in OAR 333-61-042.

5.3.2.2 Treatment Requirements and Performance Standards

Treatment requirements and performance standards are presented in OAR 333-61-032. For surface water, the general requirements for this rule require treatment processes that reliably achieve both of the following:

- At least 99.9% (3-log) removal and/or inactivation of *Giarida lamblia* cysts between a point where the raw water is not subject to recontamination by surface water runoff and a point downstream before or at the first customer.

- At least 99.99% (4-log) removal and/or inactivation of viruses between a point where the raw water is not subject to recontamination by surface water runoff and a point downstream before or at the first customer.

The specific treatment requirements to meet the above pathogen removal requirements for surface water are dependent on whether filtration is provided. For surface water systems with filtration, both filtration and disinfection are required to achieve the pathogen removal requirements. The filtration process must meet the turbidity removal requirements discussed earlier in this section. The disinfection process must be sufficient to ensure that the total treatment process will achieve the required pathogen removal. Additionally, the disinfectant concentration in the water entering the distribution system cannot be less than 0.2 mg/l for more than 4 hours, and the disinfectant concentration in the distribution system cannot be undetectable in more than 5% of the samples taken.

For systems that utilize groundwater as the source, continuous disinfection is required only when there are consistent violations of the total coliform rule.

5.3.2.3 Treatment Requirements for Corrosion Control

The treatment requirements and performance standards for corrosion control are set forth in OAR 333-61-034. All public water systems are required to monitor for lead and copper levels in the system. Monitoring guidelines are outline in OAR 333-61-034. When the concentration of lead and/or copper exceeds the action levels for these contaminants, as explained earlier in this chapter, the public water system is required to adhere to the subsequent treatment requirements for corrosion control.

5.3.3 Watershed Control

OAR Chapter 333 sets forth requirements for watershed control for surface water sources.

These requirements apply only to public water systems that do not provide filtration treatment. Non-filtering systems must conduct annual sanitary surveys of the watershed for review by the Oregon Health Division. The sanitary surveys include evaluation of the following man-made and natural features:

- Nature and condition of dams, impoundments, intake facilities, diversion works, screens, disinfection equipment, perimeter fence, signs, and gates.

- Nature of surface geology, character of soils, presence of slides, character of vegetation and forests, animal population, and amounts of precipitation.

- Nature of human activities, extent of cultivated and grazing land, zoning restrictions, extent of human habitation, logging activities, method of sewage disposal, proximity of fecal contamination to intake, recreational activities, and measures to control activities in the watershed.

- Nature of raw water, level of coliform organisms, vulnerability assessments of potential contaminants, algae, turbidity, color, mineral constituents, detention time in reservoir, and time required for flow from sources of contamination to intake.

- Type and effectiveness of measures to control contamination and algae, disinfection applications and residuals carried, monitoring practices, and patrol of borders.

5.3.4 Water Resources Department Water Conservation

The Oregon State Water Resources Department (WRD) has developed Oregon Water Management Program policies and principles for water resource issues, including water conservation and efficient water use. A WRD document dated December 1990 describes the policy on water conservation as a high priority for the WRD. Included in this policy is the improvement of water use efficiency through the implementation of voluntary conservation measures. Principles to promote conservation and efficient water use provided in the WRD document are as follows:

- Water users shall construct, operate, and maintain their water systems in a manner which prevents waste and minimizes harm to the waters of the state and injury to other water rights.

- Major water users and suppliers shall prepare Water Management Plans under the guidance of schedules, criteria, and procedures.

- The Commission (a governor-appointed citizens group that adopts water resources rules for the State of Oregon) shall encourage and facilitate the development of sub-basin conservation plans throughout the state by local advisory committees.

- When wasteful practices are identified in Water Management Plans and Sub-basin Conservation Plans, the Commission shall adopt rules prescribing statewide and sub-basin standards and practices.

- A conservation element shall be developed and included in each basin plan when a major plan review and update is preformed.

- The collection, analysis, and distribution of information on water use and availability are necessary to ensure that the waters of the state are managed for maximum beneficial use, and to protect the public welfare, safety, and health.

- The Commission shall support public education programs, research, and demonstration projects to increase citizen and water user awareness of water conservation issues and measures in the state.

- The Commission shall support programs to provide economic assistance to water users to implement desired conservation measures, particularly where the benefits of implementing the measures are high.

OAR Chapter 690 is the applicable water resource management rules developed by WRD. Division 18 of OAR Chapter 691 covers the allocation of conserved water. These rules describe a voluntary program intended to benefit a water right holder from water conservation and efficient water use.

5.4 General Water Quality

5.4.1 Turbidity Removal

As covered in OAR 333-61-030, the MCL for turbidity is applicable only to surface water sources, and is dependent on the type of treatment facilities employed. The requirements are shown in Table 26.

Table 5-4: Turbidity Removal Requirements

Filtration Systems	Criterion (MCL)	Monitoring	Compliance
Conventional or Direct Filtration	0.3 NTUs (up to 1 NTU)	Continuous or grab / 4 hours	95% monthly samples < MCL; none > 5 NTU
Slow Sand Filtration	1 NTU (up to 5 NTU)	Continuous or grab / 4 hours (one / day)	95% monthly samples < MCL; none > 5 NTU
Diatomaceous Earth Filtration	1 NTU	Continuous or grab / 4 hours	95% monthly samples < 1 NTU; none > 5 NTU
Other Filtration Technologies	1 NTU (up to 5 NTU)	Continuous or grab / 4 hours (one / day)	95% monthly samples < MCL; none > 5 NTU

5.4.2 Pathogen Removal

As covered in OAR 333-61-032, the pathogen removal (disinfection) requirements are dependent on the type of source water and whether the treatment facilities provide filtration.

For water from groundwater sources, continuous disinfection is not required by the regulations unless repeated violations occur. Typically, the regulations require that when chlorine is used as the disinfectant, the residual disinfectant concentrations cannot be less than 0.2 mg/l after 30 minutes of contact time under all flow conditions.

For surface water sources, pathogen removal requirements are dependent on whether the treatment facilities provide filtration. Maximum removal requirements are for 99.9% (3-log) inactivation of *Giarida lamblia* cysts. Additionally, the residual disinfectant concentration in the water entering the distribution system cannot be less than 0.2 mg/l for more than 4 hours. Disinfection of surface waters is evaluated by comparing the required and actual contact time (CT) values. Based on the removal requirements and water pH and temperature, a required contact time value can be found either in OAR or in the EPA document *"Guidance Manual for Compliance With the Filtration and Disinfection Requirements for Public Water Systems Using*

Surface Water Sources" dated October 1990. The actual contact time value is the known chlorine contact time (in minutes, including consideration for effectiveness) multiplied by the chlorine residual concentration (in mg/l, usually from plant operation records). Actual contact time must be greater than required contact time.

5.4.3 Contact Time

Contact time is required for all surface water systems, as outlined above, and for chlorinated groundwater systems. Actual chlorine contact time is highly dependent on the hydraulic efficiency of the contact chamber. For example, the hydraulic efficiency of a small diameter pipeline is much greater than that of an unbaffled reservoir. Table 27 shows various facility alternatives, estimated hydraulic efficiencies for each, and the volume required assuming 55 gpm for the High System, 89 gpm for the Lower System (peak hour, 20-year design), and a contact time of 30 minutes.

Table 5-5: Chlorine Contact Times

Chlorine Contact Facility	Hydraulic Efficiency	High System Required Volume (gallons)	Lower System Required Volume (gallons)
Small Diameter Pipeline (12-inch diameter or less)	90	1,800	3,000
Large Diameter Pipeline (greater than 12-inch diameter)	80	2,050	3,500
Baffled Reservoir	20	8,250	13,400
Unbaffled Reservoir	10	16,500	26,700

5.5 Lead and Copper Levels

The State places stringent limits on the lead and copper levels in drinking water and requires an intensive monitoring program for these contaminants. Because lead and copper in drinking water often come from the corrosion of residential plumbing, samples for lead and copper measurement are taken primarily from residences.

If not in compliance, the steps required of the water supplier to comply with State regulations are outlined in OAR 333-61-036 and begin with a Lead and Copper Water Treatment Study. The study will evaluate the effectiveness of the following treatment options:

- Alkalinity and pH adjustment
- Calcium hardness adjustment
- Addition of a corrosion inhibitor.

5.6 Other Water Quality Issues

Other water quality issues that are controlled by state regulations include organic and inorganic chemicals, radionuclides, and disinfection by-products. These water quality parameters are discussed below.

- Organic and Inorganic Chemicals – The State requires monitoring of many new chemicals including volatile organic chemicals, synthetic organic chemicals, and inorganic chemicals. Testing of the city water for these chemicals is required.

- Radionuclides – The State requires monitoring and control of specific radionuclides. Testing of the city water for radionuclides is required.

Disinfection By-Products – Compliance and testing for disinfection by-products includes both Maximum Residual Disinfectant Levels (MRDLs) for chlorine compounds and MCLs for disinfection by-products such as THMs. By January 2002, all surface water systems serving 10,000 people or more will be required to test for and control disinfection by-products. By January 2004, all surface and groundwater systems, regardless of size, will be required to test for and control disinfection by-products.

Section 6: Capital Improvement Plan

6.1 Introduction

In this section, specific improvements are identified and recommended for implementation over the 20-year planning period. The improvements are outlined in detail in the previous sections and Section 6.2 and provide for compliance with regulations, addressing system deficiencies, system reliability, and additional capacity.

Budget amounts are provided for improvements and they included the following:

- Opinion of probable construction cost
- 20% markup for contingency
- 25% markup for engineering, legal, and administrative costs.

Budget level estimates are considered reliable within a margin of plus or minus 20%. These estimates do not include costs associated with obtaining funding such as application preparation, bond council, interim financing, etc. These costs will be highly dependent on the funding source and requirements.

The opinion of probable cost has been rounded up to the nearest $1,000, $10,000, or $100,000 depending on the size of the project. For instance, a dollar value of $18,500 would be rounded up to $19,000; a dollar value of $86,000 would be rounded up to $90,000; and a dollar value of $386,000 would be rounded up to $400,000.

The improvements have been arranged into a capital improvements plan (CIP) which lists the improvements, the opinion of probable cost, and the time when the improvement will be needed. The schedule for improvements is dependent in large part on the actual growth within the existing service area and expansion of the service area. The schedule may accelerate or slow down based on growth. Therefore, the schedule should be used more as a guide.

When determining when to start a project, it is important to remember that larger projects will take a substantial amount of time to complete. It is reasonable to expect that a large project such as expansion of the treatment plant capacity could take 3 years to complete from inception through funding, land use planning and permitting, design, and construction.

6.2 Project Descriptions

In this section, specific improvements are discussed in an itemized fashion, summarizing the system needs identified in Section 4. Note that there is no particular order to the CIP numbering system. All CIP costs are presented in Table 6.1 following the individual project descriptions.

6.2.1 Project 1: Well No. 2

While initial testing has been conducted at the site of Well No. 2, further testing will determine whether the well will serve as an additional water source or a backup source to the Behrman Well. In either case, Well No. 2 will need to be outfitted as a production well with a pump, controls, a building, onsite power generation, and all associated valves and piping. The two possibilities are further outlined below.

6.2.1.1 1A: Additional Water Source

Should the expected influence of Well No. 2 on the Behrman Well water yield be deemed inconsequential, the new well will be put into production alongside the existing well. The two sources will then work together to feed the Carsten Reservoirs and supply water to the Banks system. In this scenario, two options exist for the piping connection into the water system: (i) Expand the 6-inch line that transmits water from the Behrman Well to Carsten Reservoir No. 1 to handle the additional capacity coming from Well No. 2, or (ii) install a parallel 6-inch line that only transmits the Well No. 2 water to the Carsten Reservoir site. Either option is feasible, but the second option is more practical from a cost standpoint.

6.2.1.2 1B: Backup Water Supply

If it is concluded that Well No. 2 dewaters the Behrman Well's aquifer such that both sources cannot be used simultaneously, the new well will be put into production with the intent that it will serve as a secondary source of groundwater extraction at the Behrman Well site. The two wells would be controlled by a central control panel that interfaces between each and communicates which well should be in operation at any given time. In this scenario, the Banks water system will not be receiving supplementary water to what it currently receives, but rather a redundant source of water will be put into production furthering the longevity of the City's assets and having backup pumping capabilities should the Behrman Well pumps fail. This option involves teeing off of the existing 6" line from the Behrman Well and adding a one-way check valve. The elimination of extensive trenching and piping needs greatly reduces the cost to put Well No. 2 into operation.

6.2.2 Project 2: Transmission Pipeline Replacement and Upgrade

The transmission main should be abandoned following the entire 3.2-mile length traveling south from the SSFP, to the North Star Reservoir, to Sellers Rd., along Sellers Rd. through the PSV/PRV, and into the Main Zone. Replace existing line with a 10-inch pipe extending to the 14-inch line at Main St. (Hwy 47). Also, upgrade the PSV/PRV by installing a new vault and valves. The new vault will be complete with a 6- or 8-inch main valve setup to accommodate periods of high flow, and a 2-inch bypass valve setup for normal operation.

6.2.3 Project 3: SSFP Disinfection Upgrades, Onsite Backup Power Generation, Decommission of North Star Reservoir, Creation of Intermediate Pressure Zone, and Addition of Individual PRVs

The gaseous chlorine disinfection system located at the North Star Reservoir should be decommissioned for safety and reliability purposes, and a new disinfection system should be

installed and connected at the SSFP site. Once disinfection capabilities are relocated, the aging North Star Reservoir can be decommissioned and taken offline.

The recommended new disinfection system consists of a sodium hypochlorite feed system that injects sodium hypochlorite into the treated water flow stream. The High Zone Reservoir would then be utilized as a clear well (and a storage facility) to achieve appropriate disinfection contact time and consolidating the treatment and disinfection of the water coming from the Green Mountain Springs. The system with the highest reliability is *onsite* sodium hypochlorite generation. In this scenario, salt is stored onsite and provisions for generating the disinfectant are taken.

The third portion of this capital improvement project is to install an onsite backup power generator at the SSFP. This system would store fuel in order to power all the electrical equipment utilized in the treatment process. It is estimated that a 25 KVA backup generator would power the existing pad transformer during an emergency. A more detailed electrical analysis needs to be performed during pre-design in order to correctly size, locate, and connect the generator.

The fourth component of this project is to install a PRV station at the intersection of Sellers Rd. and Woolen Rd, creating a new pressure zone called the Intermediate Zone. This, coupled with an adjustment to the settings of the existing PSV/PRV station, will create more favorable pressures for the users in the High and Intermediate Zones. Internal pipe pressures will also be decreased, thereby reducing leakage of treated water.

The fifth component of this project is to add individual PRV's to each service in the high zone. This should be done prior to decommissioning the North Star Reservoir.

Amendment #1

Refer to section 2 and 3 of Amendment #1 found in Appendix C for a more detailed description of the improvements.

Project 3.1 – Clearwell Flow & Level Control

This includes three flow control valves.

- A modulating butterfly valve for flow control located downstream of the clearwell controlled by the flow rate into the clearwell.
- An actuated butterfly valve (on/off) located just upstream of the clearwell controlled by the level in the clearwell.
- A modulating butterfly valve located just upstream of the Carsten Reservoirs controlled by the operation at the water treatment plant.

Project 3.2 – SSF Capacity Controls

This includes two flow control improvements.

- A two way altitude valve with a pressure relief override located upstream of the Carsten Reservoirs.
- A low flow bypass (1-inch PRV valve) located in the Sellers Road PRV station.

6.2.4 Project 4: Groundwater Upgrades: Disinfection and Emergency Power

The gaseous chlorine disinfection system located at the Behrman Well should be decommissioned for safety and reliability purposes, and a new disinfection system should be installed and connected at the Behrman Well site.

Sodium hypochlorite is the recommended new disinfection system to replace the gaseous chlorine currently used. The chemical can either be generated onsite in the same manner as discussed above for the treatment plant site, or can be delivered due to weather not being a factor. In either case, the disinfectant will be connected to the discharge line of the Behrman Well (and Well No. 2 once it is put into production). The system will continue to utilize the transmission pipeline and Carsten Reservoir No. 1 to achieve appropriate disinfection contact time.

In addition, a backup generator set is recommended to store fuel and supply power to both groundwater wells. The generator can be sized to supply power to both wells simultaneously (Project 1A) or individually (Project 1B). In either case, automatic transfer switches will need to be installed on both pumps' control equipment to ensure that each starter can be fed from backup power.

6.2.5 Project 5: 1.0-MG Reservoir

In order to provide sufficient equalization, peaking, and emergency storage volume to the expanding population of Banks, a 1.0 million gallon reservoir needs to be constructed to serve more customers in the Main Zone. If space permits a third tank could be added to the Carsten Reservoir site, otherwise a location study will need to be undertaken and property acquired.

Independent of the location, the new reservoir overflow elevation will depend on the elevation of the new services to water users. If the growth of the City occurs at similar elevations to the existing users, then the overflow elevation of the new tank would be identical to the existing Main Zone (Carsten) reservoirs (+/- 414 ft) and feed the same pressure zone. If expansion occurs where it would be convenient to create a new pressure zone, then the overflow elevation of the reservoir will be raised or lowered to accommodate ideal operating pressure for the service connections and fire hydrants being fed by the additional storage volume.

The tank will be a 1.0-MG steel reservoir constructed on a concrete pad. An inflow pipeline sized to fill the reservoir from either the existing or new source capacities will be installed. An outflow pipeline sized to deliver adequate water to the expanded distribution system network will also need to be installed.

6.2.6 Project 6: Distribution System Looping and Upgrades

The location and brief description of the proposed projects to loop portions of the distribution system are in the following paragraphs. In total, roughly 2,750 feet of pipe is recommended to be added to the distribution network or to upgrade certain undersized lines.

None of the distribution system projects are high priority, but to assist the City they have been prioritized with regard to each other.

6.2.6.1 6A: Intersection of Woodman Ave. and Park St. - #1

Upgrade approximately 620 feet of 2-inch line on Park St. with 8-inch line and connect to 6-inch line in Woodman Avenue with 30 feet of 8-inch pipe.

6.2.6.2 6B: East of intersection of Parmley Ave. and Woodman Ave - #2

Connect 6-inch lines with approximately 180 feet of 6-inch pipe.

6.2.6.3 6C: End of Wilkes St. - #3

Connect dead-end 6-inch line to 12-inch main on Railroad Right-of-way with approximately 250 feet of 8-inch pipe.

6.2.6.4 6D: Commerce St., from Market St. to Sunset Ave. - #4

Construct 825 feet of 8-inch line to eliminate two dead-end lines.

6.2.6.5 6E: Jarvis Pl. to Elmhurst Ct. - #5

Construct 680 feet of 8-inch pipe to eliminate four dead-end lines.

6.2.6.6 6F: Cedar Canyon Rd - #6

Upgrade approximately 400 feet of existing 2-inch line to 6-inch line. If the UGB is expanded to the west, this line should be upgraded to a 12-inch back to Highway 47.

6.2.6.7 6G: Lumber Yard - #7

Connect the dead-end 8-inch line to the 12-inch main due east with approximately 480 feet of 8-inch pipe.

6.2.6.8 6H: Sunset Park - #8

Connect the dead-end 6-inch line to the 12-inch main along Main St. by boring underneath Highway 47 with approximately 180 feet of 8-inch pipe.

6.2.6.9 6I: Shopping Center south of Oak Way - #9

Connect the 4-inch and 6-inch dead-end lines with approximately 300 feet of 6-inch pipe.

6.2.7 Project 7: SCADA System Upgrades

In order to better provide automated monitoring of system variables and centralized access to controls, a telemetry system should be installed to monitor system information remotely and record and process it at the Public Works building. Instrumentation, software, and hardware will be required at the SSFP site, the Carsten Reservoir site, the Behrman Well site, and any new sites connected to the City's water system.

6.2.8 Project 8: Automatic Meter Reading

6.2.8.1 8A: Radio Read

One AMR system available is the Radio technology. This includes a new meter for each existing connection, the reading hardware, and a central computer with the applicable software.

6.2.8.2 8B: Fixed Network

The other option for AMR is the Fixed technology. This includes a new meter for each existing connection, the collector units placed strategically with a density of roughly one collector per square mile, and a central computer with the applicable software.

6.2.9 Project 9: Security System Upgrades

The cost to furnish and install equipment varies greatly depending on the level of security upgrades selected.

6.2.9.1 9A: Simple Security

If strictly fences, signs, and gates (deterrents) are opted for, then the proposed upgrades are estimated to cost roughly $50,000.

6.2.9.2 9B: Advanced Security

If more advanced security systems involving cameras and motion detectors are installed, the systems will cost approximately $100,000.

The CIP summary table is shown in Table 6-1. The costs shown are 2008 dollars. Therefore, the City will need to adjust the costs depending upon when the projects are actually undertaken.

6.2.10 Project 10: Leak Detection Survey

Prior to performing any major pipeline replacements, it is recommended that a comprehensive leak survey be carried-out. The purpose of the survey is to pinpoint the location of leaks within the City's distribution and transmission pipeline network, and target those areas first. Ultimately, by performing the Leak Detection Survey, Banks' high unaccounted-for water volume will be decreased by having a greater understanding of the source of water loss.

6.2.11 Project 11: Additional Source Development

This is a multi-step program that involves short and long term tasks.

6.2.11.1 11A: Quail Valley Golf Course

Begin discussion with the Golf Course owner with regard to the transfer of water rights to the City of Banks. If this proves feasible, then move forward with the hydrogeological Study, water rights transfer from the Golf Course to the City, design and construction. This would include approximately 4,000 feet of 8-inch pipe, land purchase, plus a new well pump, controls, standby generation and a building.

6.2.11.2 11B: Seller Road Well Field

Begin discussion with property owners to determine where test wells could be developed. If this proves feasible, then move forward with the hydrogeological Study, transfer of water rights from the springs, design and construction. This would include approximately 3,500 feet of 8-inch pipe plus four new, controls, standby generation and buildings.

6.2.11.3 11C: Southwest Well Field

Begin discussion with property owners to determine where test wells could be developed. If this proves feasible, then move forward with the hydrogeological Study, transfer of water rights from the Behrman wells, design and construction. This would include approximately 2,500 feet of 8-inch pipe plus two new wells, controls, standby generation and buildings.

6.2.11.4 11D: Alternative Water Providers

Begin discussion with alternative water providers. This would include the City of Forest Grove, and TVWD. Discussions can also begin with TVID for potential use of irrigation water in the future.

6.3 CIP

This section contains the recommended Capital Improvements to the Banks water system over the next 20 years. The following Table 6-1 contains an overview of each Capital Improvement Project described in Section 6.2.

Either 1A or 1B will be constructed based upon the outcome of the hydrogeological evaluation that is now in progress. The total CIP amount assumes 1A will be selected.

The improvements for additional source will need to be updated as more information is developed such as the exact location of the new wells, negotiations between owners and agencies, and the outcome of further hydrogeotechnical studies.

Items 7, 8 and 9 are optional.

Amendment #1

Table 6-1 is replaced by Table 2 in section 5 of Amendment #1 found in Appendix C.

Table 6-1: Water System Capital Improvement Plan

Project	Description	Total Project Cost	Schedule	SDC Eligible Cost
1A –	Well No. 2 – Additional Source	$670,000	2009	$670,000
1B –	Well No. 2 – Backup Supply	$540,000	2009	$540,000
2 –	Transmission Pipeline Replacement	$2,750,000	2009 - 2010	$530,000
3 –	SSFP Site Upgrades, Creation of Intermediate Pressure Zone	$270,000	2010 - 2011	$0
4 –	BW Site Upgrades*	$220,000	2012 - 2013	$0
5 –	1.0-MG Main Zone Reservoir	$2,200,000	By 2024	$2,200,000
6 –	Distribution System Looping and Upgrades	$620,000	2010-2024	$0
7 –	SCADA System Upgrades	$450,000	optional	$0
8 –	Automatic Meter Reading	$420,000	optional	$0
9 –	Security System Upgrades	$100,000	optional	$0
10 –	Leak Detection Survey	$10,000	2009	$0
11A	Quail Valley Golf Course Study	$40,000	2010	$40,000
	Design & Construction	$1,200,000	2011	$1,200,000
11B	Sellers Road Wellfield Study	$150,000	2011	$150,000
	Design & Construction	$2,400,000	2012	$2,400,000
11C	Southwest Well Field Study	$300,000	2013	$300,000
	Design & construction	$1,500,000	2014	$1,500,000
11D	Alternative Water Providers	$0	2010	$0
	CIP Total:	**$13,300,000**		**$8,990,000**

* If project number 4 is combined with project number 1 there is potential to reduce overall costs slightly.

Section 7: Funding Sources

This section contains a list of the standard funding agencies and programs for public works infrastructure construction projects with a general description of the program and contacts for further information. If the City wishes to fund a project it is highly recommended to attend a "one-stop" meeting in Salem. Representatives of all the funding agencies attend and will let you know what they have available for your project.

7.1 Federal Programs

7.1.1 Rural Utilities Service Water and Wastewater Loans and Grants

The U. S. Department of Agriculture's Rural Utilities Service (RUS) program provides funding for rural areas and towns with populations of up to 10,000. Assistance includes loans and grants. Funds may be used for installation, repair, improvements, or expansion of rural water distribution and treatment facilities. The costs of land acquisition and legal and engineering fees are eligible for funding if they are necessary to develop the facility.

7.1.1.1 Eligibility Requirements

Water and wastewater loans and grants are available to public entities including municipalities, counties, special purpose districts, Indian tribes and non-profit corporations. Applicants must be unable to obtain the required funds via commercial sources under reasonable terms. Entities must have legal capacity to borrow and repay the loans, must pledge security for the loans, and must be able to efficiently maintain and operate the proposed facilities. The facilities to be funded must be consistent with development plans of the state, multi-jurisdictional area, county, or municipalities where the projects are to be constructed. The facilities must also comply with all relevant local, state, and federal laws including zoning, pollution control, and health and sanitation standards. Because funds are scarce, existing compliance problems are essentially a requirement.

7.1.1.2 Terms

Borrowers of RUS loans must be able to demonstrate the following:

- They have monthly user rates higher than the "statewide average" as defined by RUS. This value changes so it should be verified before proceeding with an application.
- They have legal authority to borrow and repay loans, to pledge security for loans, and to operate and maintain the facilities and services.
- They are financially sound and able to manage the facility effectively.
- They have a financially sound facility based on taxes, assessments, revenues, fees, or other satisfactory sources of income to pay for all facility costs, including operations and maintenance, and to retire indebtedness and maintain a reserve.

The maximum loan term is 40 years but the term may not exceed statutory limitations on the agency borrowing the money or the expected useful life of the improvements. The debt reserve can typically be funded at 10 percent per year over a 10-year period. Loan interest rates and maximum grant amounts are based on median household income as shown in Table 43.

Table 7-1: RUS Grant Funds and Loan Interest Rates

Median Household Income	Maximum Grant (portion of total project cost)	Loan Interest Rate as of July 2000
Less than 22,205	75%	4.5%
$22,205 to $27,756	45%	5.25%
Greater than $27,756	0%	5.875%

Please note that median household income, grant amounts and interest rates fluctuate and should be verified prior to proceeding with an application.

7.1.1.3 Contact

Information on the RUS water loan and grant program is available at the following:

Rural Utility Service
Phone: 503 414-3360
http://www.rurdev.usda.gov/

7.1.2 Community Development Block Grants

The U.S. Department of Housing and Urban Development provides grant under the Community Development Block Grant (CDBG) program to facilitate economic development by revitalizing neighborhoods with improved community facilities and services. In Oregon, the Oregon Economic and Community Development Department (OECDD) administer this program.

7.1.2.1 Eligibility Requirements

The program is available to non-metropolitan cities and counties. Funding may be used for the construction, expansion, or rehabilitation of public water and sewer systems to meet federal and state mandates. They are not intended for capacity building. To be eligible, the applicant must be out of compliance with federal or state rules, regulations, or permits. The service area for the project must contain at least 51 percent low- and moderate-income residents.

7.1.2.2 Contact

Information on the CDBG grant program is available at the following:

OECDD
Phone: 503 986-0123
http://econ.oregon.gov.

7.1.3 Economic Development Act of 1965

The U.S. Economic Development Administration (EDA) authorizes grants and loans under this program to assist communities in areas certified by the Secretary of Commerce as areas of substantial unemployment. Direct grants of up to 50 percent and supplementary grants of up to 80 percent of costs are authorized for water improvements to alleviate economic hardship. The program is geared to projects stimulating permanent industrial and economic development, and communities qualify for funding of water and wastewater improvements that will help create new industry or maintain or substantially increase levels of employment. Eligibility is heavily weighted in favor of projects that will result in economic development. There is a $1 million maximum allowance per project. Actual funding limits are based on the number of jobs created. We recommend that this program not be pursed unless a large economic development opportunity is identified.

7.2 State Programs

7.2.1 Special Public Works Fund

The Oregon State Legislature created the Special Public Works Fund (SPWF) in 1985. The fund, administered by the OECDD, is capitalized through the issuance of state revenue bonds and through state lottery proceeds. The SPWF is intended to promote the creation of jobs for Oregonians. Loans and grants are issued to facilitate the construction of public infrastructure to support industrial / manufacturing development as well as commercial development that is marketed nationally or internationally and attracts business from outside Oregon.

7.2.1.1 Eligibility Requirements

Eligible municipalities are described in the SPWF Applicant's handbook and generally include cities, counties, water supply districts, water and wastewater authorities, sanitary districts, port authorities, water control districts, county service districts, and tribal councils of Indian tribes.

Eligible SPWF projects includes public infrastructure needed to enable the location or expansion of eligible businesses. Specific projects include: wastewater collection and treatment capacity, publicly owned railroad spurs and sidings, purchase of rights of way and easements necessary for infrastructure, airports, port facilities, storm drainage, roadway and bridges, and water source, treatment, storage and distribution. Program funds are not eligible for equipment, wetlands mitigation, general administrative costs, construction of privately owned infrastructure, or the purchase of property not related to infrastructure.

Funding levels are determined by a financial analysis based on demonstrated need. The basis for this analysis includes dept capacity, repayment sources, and applicants' ability to afford loans from additional sources. To be eligible for the program, applicants must document recent interest by eligible businesses looking to locate in the municipality. Moreover, the applicant must demonstrate ongoing marketing efforts relating to economic development of industrial lands.

7.2.1.2 Terms

The following terms apply for SPWF funding:

- Maximum loan term is 25 years. A 20-year term is typical.
- Loans are typically repaid with utility revenues, general funds, voter-approved bonds, or local improvement district revenue.
- The maximum loan is $15 million.
- Grant funding is typically unavailable unless the applicant is classified as "severely affected" or a "timber dependent" community. In such a case, up to $250,000 per project may be awarded to communities without a firm commitment for new business demand.
- Grants are available under the following conditions when there is a firm commitment from one or more eligible businesses:
  - Up to $5,000 in grant funds may be awarded for each full-time-equivalent job created, depending on demonstrated financial need. The total grant funding is limited to $500,000 or 85% of the project cost whichever is less.
  - Of the total jobs created, at least 30 percent must be "family wage" jobs.
  - Public and / or private investment must equal at least two times the infrastructure cost.

7.2.1.3 Contact

Information on the SPWF program is available at the following:

OECDD
Phone: 503 986-0123
http://econ.oregon.gov.

7.2.2 OECDD Water/Wastewater Financing Program

The Oregon State Legislature created the water / wastewater financing program in 1993. It is capitalized by the sale of state revenue bonds and by a portion of state Lottery proceeds. Its primary purpose is to provide financing for construction of public infrastructure required to ensure compliance with the federal Safe Drinking Water Act or Clean Water Act. Specifically, it is intended to assist local governments facing state and federal mandates relating to public drinking water systems and wastewater systems.

7.2.2.1 Eligibility Requirements

The program is available to cities, counties, water supply districts, water and wastewater authorities, sanitary districts, port authorities, water control districts, county service districts, and tribal councils of Indian tribes with populations of less than 15,000. Detailed application requirements are available in the Water / Wastewater Financing program Applicants Handbook.

Funding levels awarded to qualified applicants are determined by a financial analysis based on demonstrated need through the program:

- Water source, treatment, storage, and distribution
- Wastewater collection and capacity
- Storm system
- Purchase of rights of way and easements necessary for infrastructure
- Design and construction engineering.

Programs funds may not be used for privately owned facilities or infrastructure, general administrative costs or the purchase of property not related to infrastructure. Eligibility for program funding is contingent upon having received a Notice of Non-Compliance, from a regulatory agency regarding the Safe Drinking Water Act or the Clean Water Act.

To be eligible for grant funding, user rates must be above the statewide average as determined by the agency.

7.2.2.2 Terms

The following terms apply:

- The maximum loan term is 25 years; a 20-year term is typical.
- Maximum grant amount is $750,00, including issuance costs and any debt service reserves (if required).
- Borrowers that are deemed "credit worthy" may be funded through the sale of state revenue binds. Maximum bonded loan amount for this mechanism is $15,000,000.
- Loans are typically repaid with utility revenue, general funds, or voter approved bon issues.

7.2.2.3 Contact

Information on the WWF program is available at the following:

OECDD
Phone: 503 986-0123
http://econ.oregon.gov.

7.2.3 Safe Drinking Water Revolving Loan Fund

Each federal fiscal year, the USEPA makes funds (as grants) available to states for the Safe Drinking Water Revolving Loan Fund (SDWRLF), a low interest loan program designed to finance drinking water system improvements needed to maintain compliance with the Safe Drinking Water Act (SDWA). In Oregon, the fund is administered by the Oregon Health Division (OHD).

7.2.3.1 Eligibility Requirements

Community and nonprofit non-community water systems are eligible for this fund. Oregon's loan request process begins by identifying and collecting information about current Oregon drinking water system project improvement needs. A Letter of Interest from the water system describing drinking water system needs is required to be considered for this fund.

In order to qualify for this fund, water rates have to be greater than or equal to 1.75% of the mean household income.

Projects that are eligible for this fund are to plan, design, or construct drinking water facilities needed to maintain compliance with the current and future standards and to further public health protection goals of the SDWA and Oregon's Drinking Water Quality Act.

7.2.3.2 Terms

The following terms apply:

- The typical loan term is 20 years. .
- Maximum loan amount is $6,000,000.
- Loans are typically repaid with utility revenue, general funds, or voter approved bond issues.

7.2.3.3 Contact

Information on the SDWRLF loan program is available at the following:

DHS
Phone: 971 673-0422
http://oregon.gov/dhs/ph/dwp/srl.shtml
or

OECDD
Phone: 503 986-0123
http://econ.oregon.gov.

7.2.4 Drinking Water Protection Loan Fund

7.2.4.1 Eligibility Requirements

These are for source water protection projects to carry out elements of a Source Water Protection Management Plan. A community water system that have a delineated Drinking Water Protection Area and are able to demonstrate a direct link between the proposed project and maintaining or improving drinking water quality.

7.2.4.2 Terms

The following terms apply:

- The typical loan term is 20 years. .
- Maximum loan amount is $100,000.
- Interest rates fluctuate quarterly.
- Disadvantaged communities are eligible for a 30 year loan.

7.2.4.3 Contact

Information on the DWPLF loan program is available at the following:

OECDD
Phone: 503 986-0123
http://econ.oregon.gov.

7.3 Local Funding Alternatives

7.3.1 General Obligation Bonds

Entities with taxing authority under the laws of the State of Oregon have the option of issuing general obligation (GO) bonds. A GO bond is a bond backed by the full credit of the issuer for the payment of which the issuer can levy *ad valorem taxes*. The issuer can make the required payments on the bonds solely from the tax levy or may use revenues from assessments, user charges or some other source. Since the bonds are secured by the power to tax, they usually justify a lower interest rate than other types of bonds. Generally, GO bonds lend themselves readily to competitive public sale at a reasonable interest rate because of their high degree of security, their tax exempt status, and their general acceptance.

These bonds can be revenue-supported because a portion of the user fee can be pledged toward payment of the debt service. This can eliminate the need to collect additional property taxes to retire the bonds. Revenue-supported GO bonds have most of the advantages of revenue bonds, but also maintain the low interest rate and the marketability of GO bonds.

Oregon law does not limit the total amount or the percentage of GO bonds that a community can issue. This portion of the property tax is outside the state constitutional restriction limiting

property taxes to a fixed percentage of assessed value. State law limits the maximum term of GO bonds to 40 years. The typical term for GO bonds is 20 to 30 years. Under the present economic climate, lower interest rates are associated with the shorter terms.

Financing of water system improvements by GO bonds is usually accomplished as follows:

1. The capital costs required for the proposed improvement are determined.
2. A general election is held to authorize the sale of the GO bonds.
3. Following voter approval, the GO bonds are offered for sale to banks and other investors.
4. The revenue from the bond sale is used to pay the capital costs associated with the project.
5. GO bond authorizations must be approved by a majority vote, and this generally limits proposals to projects benefiting all or the majority f a community. Some of the advantages of GO bonds over other types of bonds are as follows:

   - The laws authorizing GO bonds are less restrictive than those governing improvement bonds under the Bancroft Act (described below). Interest rates are not affected by the Bancroft limitations and costly assessment procedures are not required.
   - Taxes paid in the retirement of GO bonds are Internal Revenue Service deductible.
   - GO bonds can be sold prior to construction, providing funds before expenses must be paid.

The use of an *ad valorem tax* is a common method of repaying GO bonds for utility improvements. This method of financing results in the participation of all private property owners within the benefited area, whether the property is developed or undeveloped. The construction costs for the project are shared proportionally among all property owners based on the assessed value of each property.

7.3.2 Revenue Bonds

A revenue bond is a bond that is payable solely from charges made for the services provided. Such bonds cannot be paid from tax levies or special assessments, and their only security is the borrower's promise to operate the system in a way that will provide sufficient net revenues to meet the obligations of the bond issue. Revenue bonds are most commonly retired with revenue from user fees.

Successful issuance of revenue bonds depends on bond market evaluation of the dependability of the revenue pledged. Normally, there are no legal limitations on the amount of revenue bonds to be issued, but excessive amounts are generally unattractive to bond buyers because they represent high investment risk. In rating revenue bonds, buyers consider the economic

justification for the project, the reputation of the borrower, methods for billing and collecting, rate structures, and the degree to which forecasts of net revenues are realistic.

7.3.3 Improvement Bonds

Improvement bonds can be issued under an Oregon law called the Bancroft Act. Cities and special districts are limited to improvement bonds not exceeding 3 percent of the true cash value. For a specific improvement, all property within the assessment area is assessed on an equal basis, regardless of whether it is developed or undeveloped. This assessment becomes a direct lien against the property, and owners have the option of either paying the assessment in cash or applying for improvement bonds to finance the construction, and the assessment is paid over 20 years semi-annual installments with interest.

With improvement bond financing, an improvement district is formed, the boundaries are established, and the benefited properties and property owners are determined. The engineer usually determines an approximate assessment, either on a square-foot basis or a frontage basis. Property owners are then given an opportunity to remonstrate against the project. The assessments against the properties are usually not levied until the actual total cost of the project is determined. Since this determination is normally not possible until the project is completed, funds are not available from assessments for the purpose of making monthly payments to the contractor. Therefore, some method of interim financing must be arranged, or a pre-assessment program, based on the estimated total costs, must be adopted.

The primary disadvantages to this source of revenue are as follows:

- The property to be assessed must have a true cash value at least equal to 50 percent of the total assessments to be levied.

- For projects that benefit the entire City, GO bonds can be issued in lieu of improvement bonds, and they are usually more favorable.

The construction of water and sewerage facilities through the formation of improvement districts is viable when the properties bordering or served by the improvements are specifically benefited. The establishment of an improvement district should be based on a thorough evaluation of the long-range plan for the entire area. Following is a summary of the development of water improvements by this method:

1. Receive written request or petition from affected property owners for the improvement. If there is any question regarding the feasibility or approval of the project, the petitioners should provide sufficient funds to cover engineering, legal, and administrative costs associated with preliminary planning and establishing the district.

2. Establish an assessment district and preliminary cost estimates. The cost estimates presented at this time will be the basis for projecting the assessment; however, some revision may be necessary depending on the scope of the project.

3. If the project meets with the approval of the petitioners, authorize the preparation of plans and specifications. Obtain interim financing.

4. Advertise for bids.
5. Award the construction contract.
6. Construct the project.
7. Sell the bonds and repay the interim financing.

7.3.4 Capital Construction (Sinking) Fund

Sinking funds are often established by budget for a particular construction purpose. Budgeted amounts from each annual budget are carried in a sinking fund until sufficient revenues are available for the needed project. Such funds can also be developed with revenue derived from system development charges or serial levies.

7.3.5 System Development Charges and User Rates

System development charges (SDCs) are fees the City collects from developers when they develop properties that will use the water system or other municipal service. Fees are collected when building permits are issued. SDCs can be used to finance capital improvements required to provide municipal services to the development. They can only be used on projects identified in the CIP that San Diego's are being collect for. Operation, maintenance, and replacement costs cannot be financed or repaid by SDC revenues.

As established in ORS 223, an SDC has two principal elements: reimbursement and improvement. The reimbursement portion of the SDC is the fee for buying into existing or under-construction capital facilities. The reimbursement fee represents a charge for using excess capacity in an already paid-for facility. The revenue from this fee is typically used to pay back existing loans for improvements. The improvement portion of the SDC is a fee to cover the cost of capital improvements required to provide increased capacity to serve new development. Initially, the City will be able to charge an improvement fee SDC. After the facilities are constructed, the City must convert the SDC to a reimbursement fee SDC.

Water user rates are monthly fees assessed to all users connected to the water system.

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Figures

LEGEND

- RAW WATER MAIN
- TREATED WATER MAIN
- STREAM
- PROPERTY LINE
- SERVICE BOUNDARY
- ACCESS ROAD
- CONTOUR (40')
- WATER STORAGE FACILITY
- WATER SOURCE INTAKE
- FIRE HYDRANT

INTAKE STRUCTURE AND LARGE SPRING

DIVERSION DAMS AND SMALL SPRINGS

SLOW SAND FILTER PLANT AND HIGH ZONE RESERVOIR

NORTH STAR RESERVOIR AND CHLORINATION BUILDING

6" TAR-WRAPPED STEEL TRANSMISSION LINE

PRESSURE SUSTAINING / PRESSURE REDUCING VALVE

CARSTEN RESERVOIRS 1 & 2

BEHRMAN WELL

N

0 1,000 2,000

SCALE: 1" = 2,000'

Kennedy/Jenks Consultants

CITY OF BANKS
WATER SYSTEM MASTER PLAN

WATER SYSTEM MAP

K/J 0791015.10

FIGURE 1-1

LEGEND

- 8" — DISTRIBUTION MAIN WITH PIPE DIAMETER
- STREAM
- PROPERTY LINE
- CONTOUR (10')
- FIRE HYDRANT

N

0 250 500

SCALE: 1" = 500'

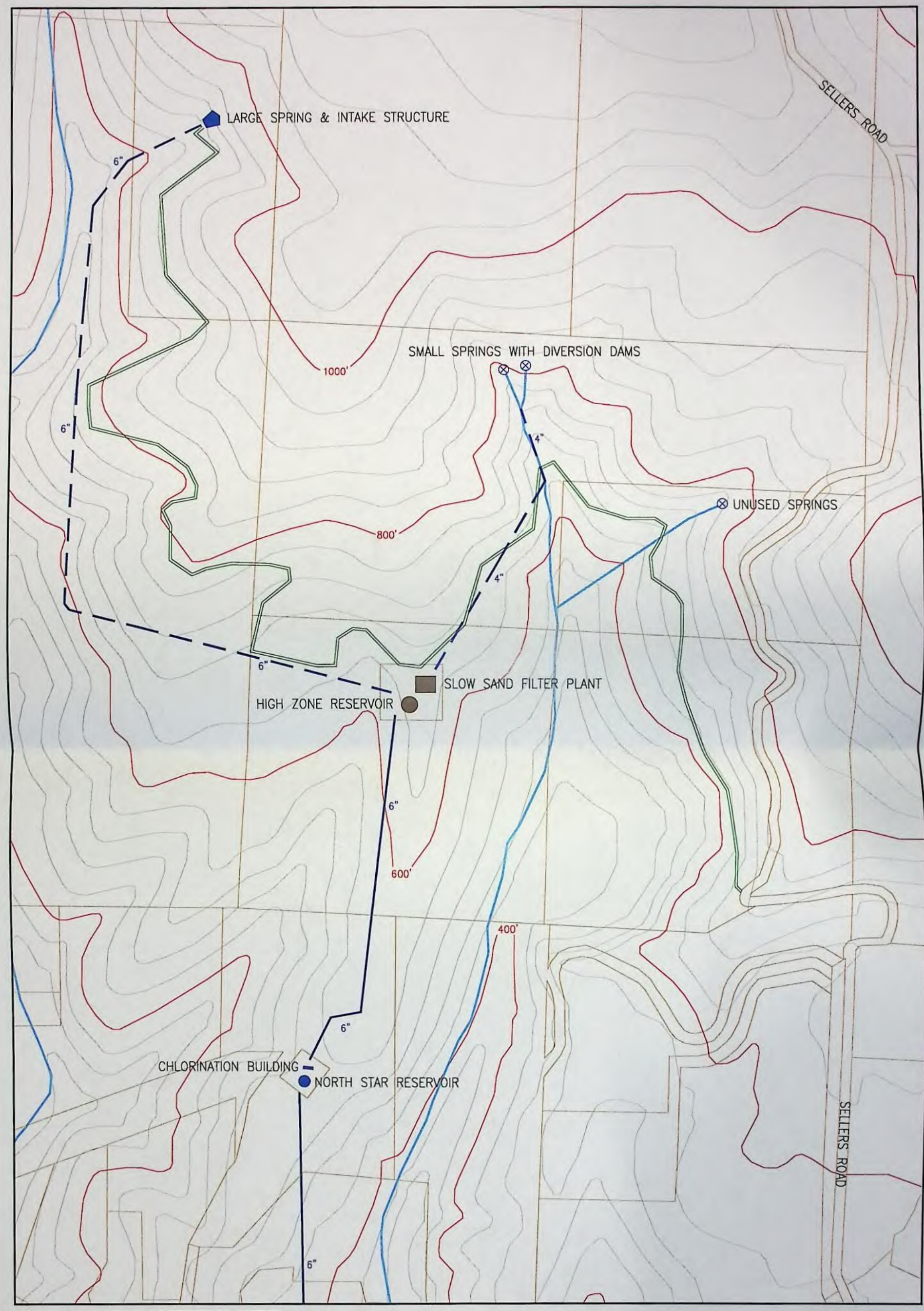
Kennedy/Jenks Consultants

CITY OF BANKS
WATER SYSTEM MASTER PLAN

DISTRIBUTION SYSTEM

K/J 0791015.10

FIGURE 1-2



LEGEND

- RAW WATER MAIN
- TREATED WATER MAIN
- STREAM
- PROPERTY LINE
- CONTOUR (200')
- CONTOUR (40')
- ACCESS ROAD

N

0 200 400

SCALE: 1" = 400'

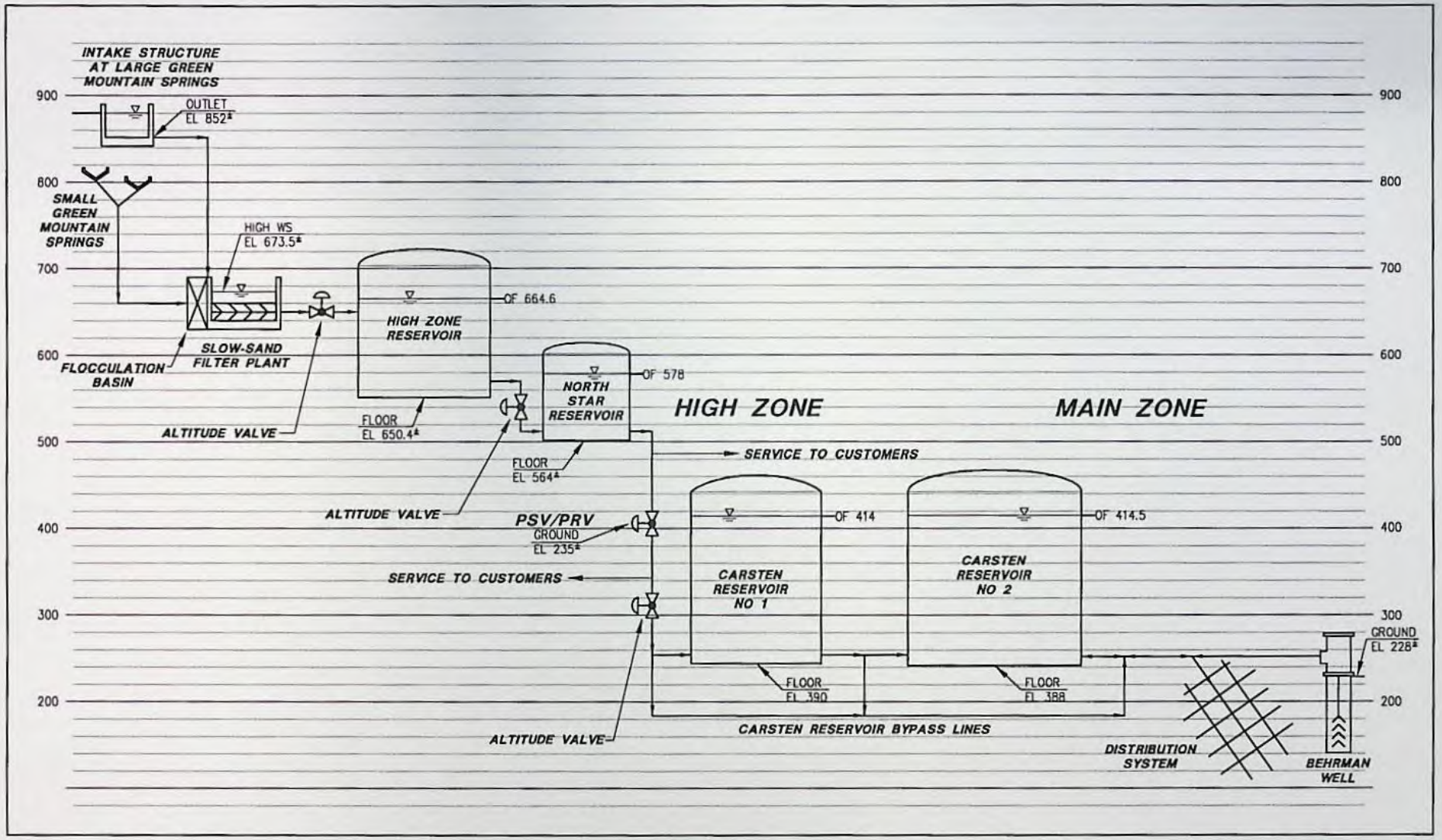
Kennedy/Jenks Consultants

CITY OF BANKS
WATER SYSTEM MASTER PLAN

SURFACE WATER SOURCE AREA MAP

K/J 0791015.10

FIGURE 1-3



Kennedy/Jenks Consultants

CITY OF BANKS
WATER SYSTEM MASTER PLAN

EXISTING SYSTEM SCHEMATIC HYDRAULIC PROFILE

K/J 0791015.10

FIGURE 1-4

LEGEND

- RAW WATER MAIN
- TREATED WATER MAIN
- STREAM
- PROPERTY LINE
- CITY LIMITS & UGB
- ACCESS ROAD
- CONTOUR (40')
- WATER STORAGE FACILITY
- WATER SOURCE INTAKE
- FIRE HYDRANT

INTAKE STRUCTURE AND LARGE SPRING

DIVERSION DAMS AND SMALL SPRINGS

SLOW SAND FILTER PLANT, HIGH ZONE RESERVOIR, AND NEW SODIUM HYPOCHLORITE BUILDING

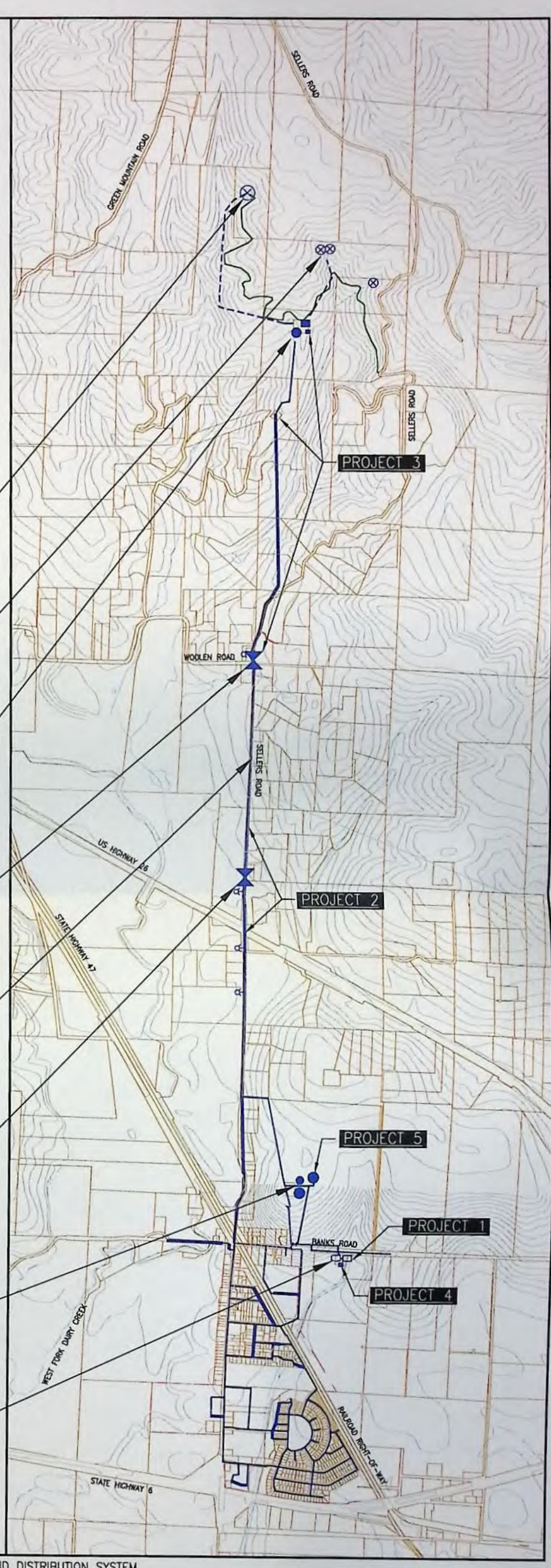
NEW PRV STATION

NEW 8" TREATED WATER TRANSMISSION LINE

PRESSURE SUSTAINING / PRESSURE REDUCING VALVE

CARSTEN RESERVOIRS 1 & 2, AND NEW 1.0-MG RESERVOIR

BEHRMAN WELL & WELL NO. 2 WITH NEW SODIUM HYPOCHLORITE BUILDING



NOTE: THICK WATER LINES INDICATE NEW OR UPGRADED FEATURES IN THE TRANSMISSION AND DISTRIBUTION SYSTEM

N

0 1,000 2,000

SCALE: 1" = 2,000'

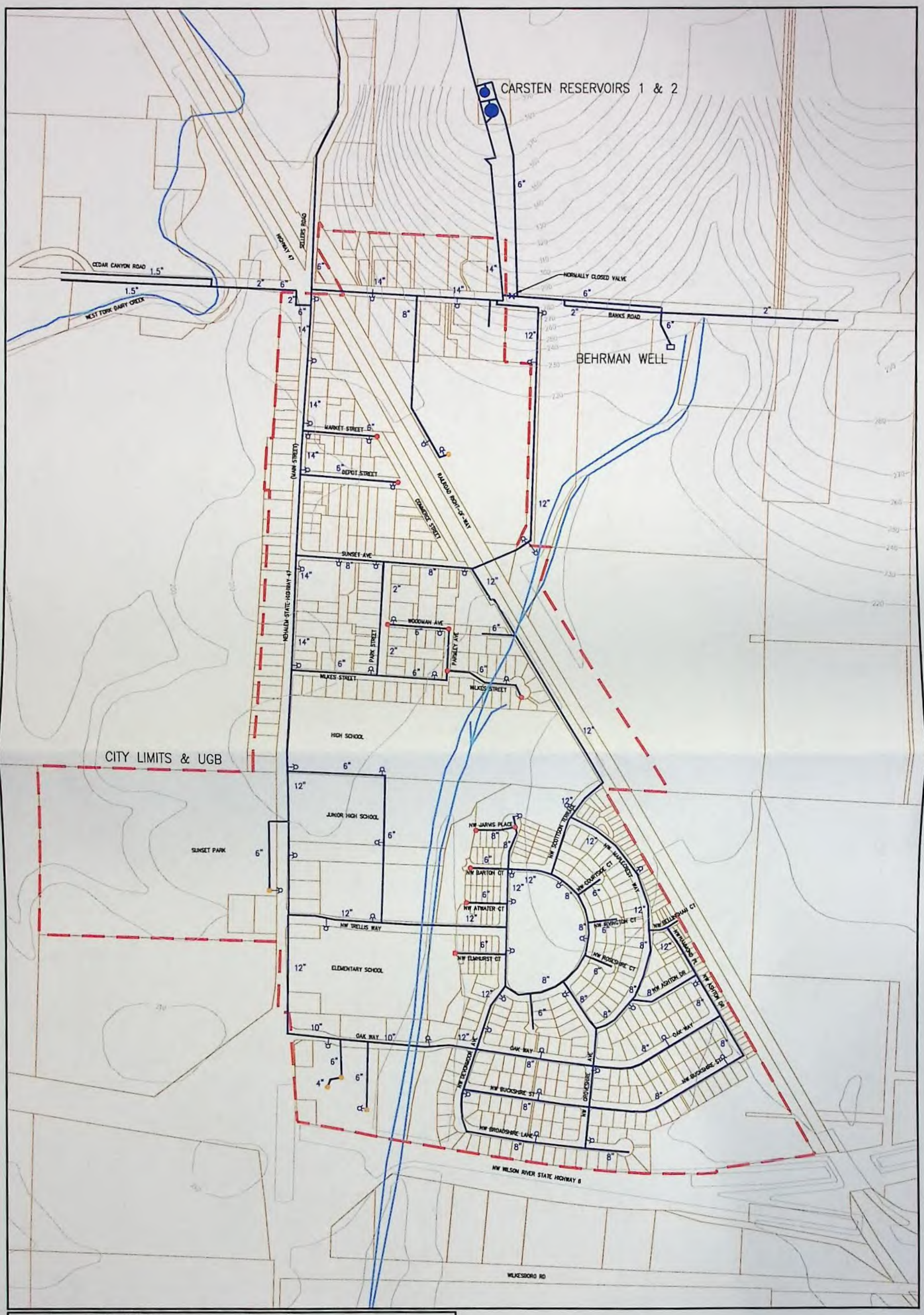
Kennedy/Jenks Consultants

CITY OF BANKS
WATER SYSTEM MASTER PLAN

FUTURE WATER SYSTEM MAP

K/J 0791015.10

FIGURE 4-1



LEGEND

- DISTRIBUTION MAIN WITH PIPE DIAMETER
- STREAM
- PROPERTY LINE
- CONTOUR (10')
- FIRE HYDRANT
- FIRE FLOW DEFICIENCY, COMMERCIAL ZONING
- FIRE FLOW DEFICIENCY, RESIDENTIAL ZONING

N

0 250 500

SCALE: 1" = 500'

Kennedy/Jenks Consultants

CITY OF BANKS
WATER SYSTEM MASTER PLAN

EXISTING SYSTEM FIRE FLOW DEFICIENCIES

K/J 0791015.10

FIGURE 4-2

NOTE: THICK WATER LINES INDICATE NEW OR UPGRADED FEATURES IN THE TRANSMISSION AND DISTRIBUTION SYSTEM

LEGEND

- 8" DISTRIBUTION MAIN WITH PIPE DIAMETER
- STREAM
- PROPERTY LINE
- CONTOUR (10')
- FIRE HYDRANT

N

0 250 500

SCALE: 1" = 500'

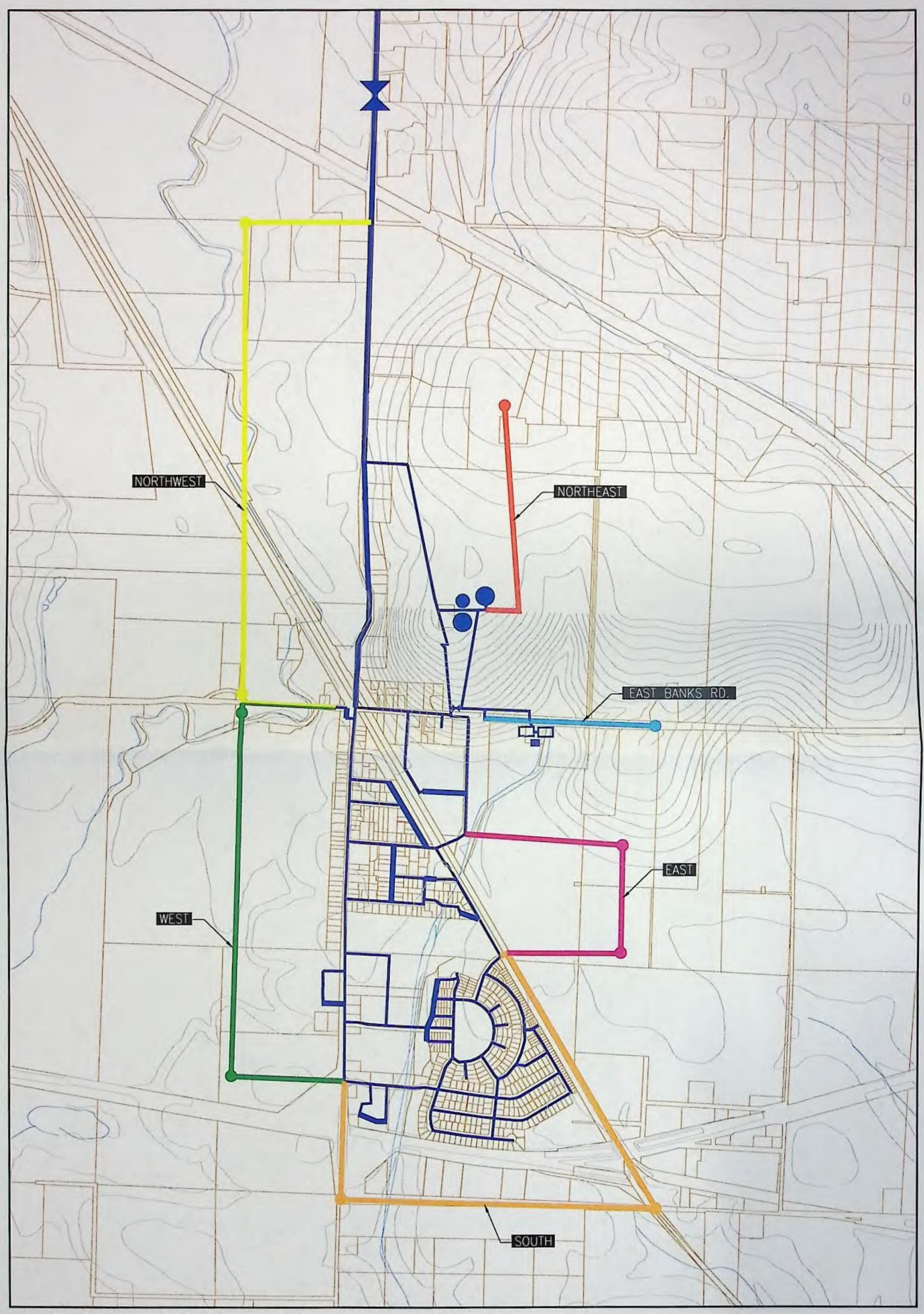
Kennedy/Jenks Consultants

CITY OF BANKS
WATER SYSTEM MASTER PLAN

FUTURE DISTRIBUTION SYSTEM

K/J 0791015.10

FIGURE 4-3



NOTE: DOTS IN EACH REPRESENTATIVE COLOR INDICATE WHERE DEMANDS WERE APPLIED FOR EACH BUILDOUT SCENARIO

LEGEND

- DISTRIBUTION MAIN
- STREAM
- PROPERTY LINE
- CONTOUR (10' & 40')

N

0 500 1,000

SCALE: 1" = 1,000'

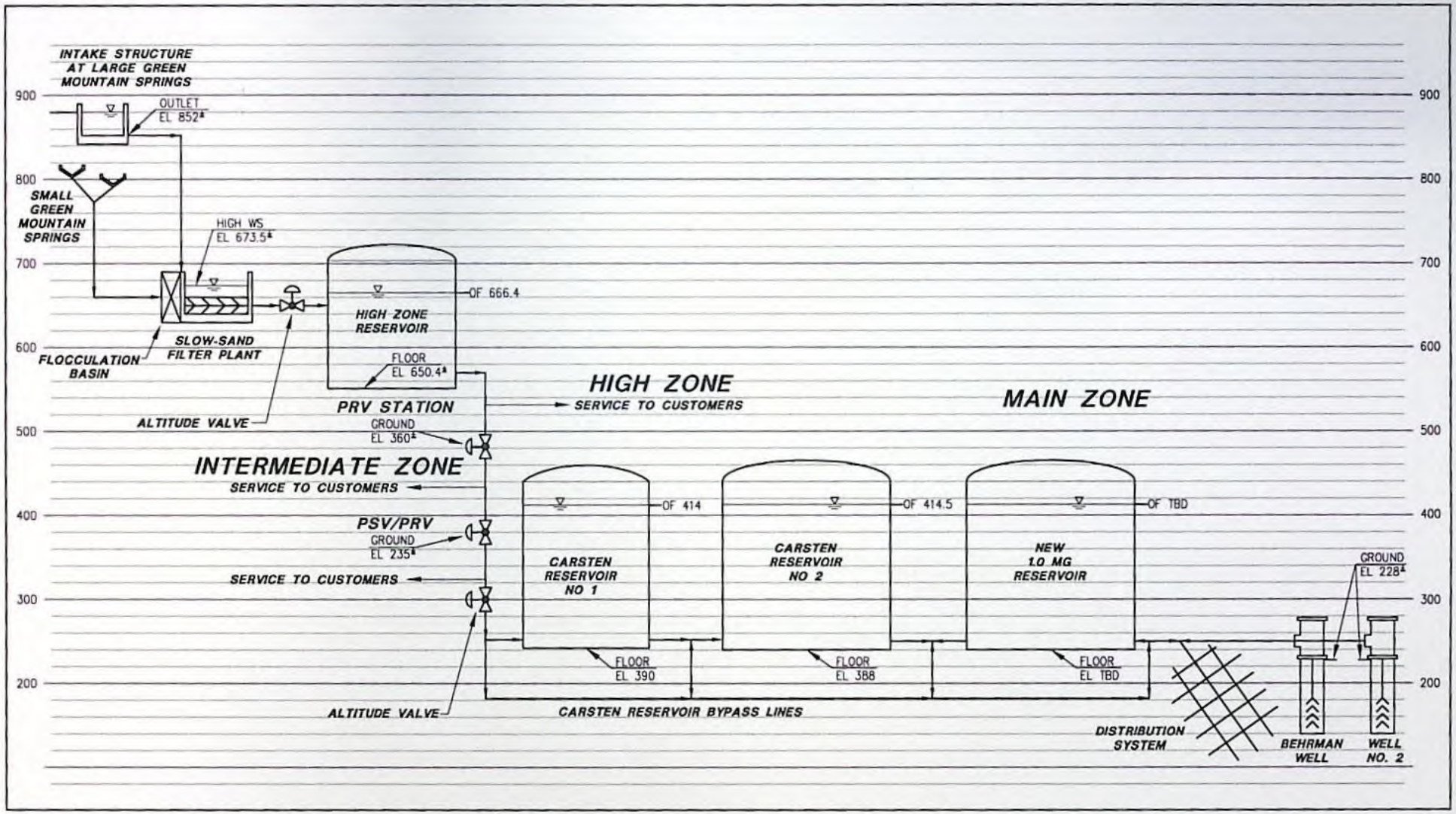
Kennedy/Jenks Consultants

CITY OF BANKS
WATER SYSTEM MASTER PLAN

FUTURE BUILDOUT SCENARIOS

K/J 0791015.10

FIGURE 4-4



Kennedy/Jenks Consultants

CITY OF BANKS
WATER SYSTEM MASTER PLAN

FUTURE SYSTEM SCHEMATIC HYDRAULIC PROFILE

K/J 0791015.10

FIGURE 4-5

Appendix A

Sanitary Survey

05-14-08 10:06 RCVD

Oregon
Theodore R. Kulongoski, Governor

Department of Human Services
Public Health Division
800 NE Oregon Street
Portland, OR 97232-2162
(503) 731-4030 - Emergency
(971) 673-0410
(971) 673-0457 - FAX
(971) 673-0372 - TTY-Nonvoice

May 12, 2008

Fred Evers
Banks Water Department – PWS #4100076
100 S. Main St.
Banks, OR 97106

Dear Fred:

Thank you for your time and assistance in conducting a **Sanitary Survey of the Banks Water Department on April 24th 2008**. The Drinking Water Program (DWP) aims to conduct a Sanitary Survey every three years to evaluate the entire water system in supplying safe drinking water to the public. I have enclosed a copy of the report for your records. Please let me know if any corrections need to be made.

The water system appears to be in good operating condition. The first page of the report lists deficiencies in the system that will have to be corrected as soon as possible. A new rule requires that all systems using a surface water source must submit a written plan within 45 days describing how and when the deficiencies will be corrected. **A corrective action plan must be submitted by June 30th 2008.** I recommend that you correct the deficiencies as soon as possible, and send written verification that the deficiencies listed were corrected and the dates of correction.

The deficiencies noted are as follows:

1. As a result of not calculating CT values correctly, the Banks Water Department is in violation of the Surface Water Treatment Rules and a Tier 2 public notice must be issued to all customers. The public notice must be re-issued every three months while the system remains in violation. A copy of the completed and distributed notice must be submitted to me to get credit for issuing the notice. Once the tracer study is completed and the actual contact time has been determined, this information can be used to determine if CT values are being met and then the public notice can be lifted.

2. A tracer study for the Northstar tank is required to determine the actual amount of contact time available prior to the first user. Attached is a fact sheet on conducting tracer studies. In addition, you may contact our circuit riders, HBH Consulting Engineers at (503) 625-8065 for free assistance in conducting the study as well as any other short-term operational projects you may have. Once complete, submit a copy of the study results to me.

3. The residual disinfectant concentration of the water must be measured and recorded at least three times a day at the entry point to the distribution system (i.e. the outlet of the Northstar tank). The day's samples cannot be taken at the same time, but at least one should be taken during peak flow. If at any time the residual disinfectant concentration falls below 0.2 mg/l, the system must take measurements every 4 hours until the residual disinfectant concentration is 0.2 mg/l.

4. A review of the Surface Water Quality Data Forms for this system shows that CT calculations are being done incorrectly. The actual CT value achieved must be calculated each day the treatment plant is in operation. The parameters necessary to determine the actual CT value must be monitored and recorded on the Surface Water Quality Data Form as follows:

    a. The temperature of the disinfected water must be measure at least once per day at the first user.
    b. The pH of the disinfected water must be measured at least once per day at the first user.
    c. The disinfectant contact time ("T") in minutes must be determined for each day during peak hourly flow, based on results of a tracer study (see deficiency #2 above).
    d. The residual disinfectant concentration ("C") in mg/l before or at the first customer must be measured. Report the highest of the three daily measurements (see deficiency #3 above).

5. A physical separation is required between untreated surface water and treated surface water. Therefore all bypasses around the Northstar tank must be physically removed. This includes the valve identified during the survey as well as the valve bypass.

6. Install a turbidimeter on the combined filter effluent (CFE) line prior to any storage and as close to the filter effluent as possible. Turbidity measurements must be performed on filtered water prior to any storage at least daily. Record the readings from this location on your monthly Surface Water Quality Data Form.

7. Calibrate all turbidimeters each calendar quarter according to the manufacturer's specifications.

8. The well lacks a current Radiologicals test. Four consecutive quarters of Gross Alpha, Radium 226/228, and Uranium must be collected at the entry point from the well beginning as soon as possible. If results are non-detect for the first two quarters, the last two quarters of testing may be waived.

9. A test needs to be done for Asbestos since there is some Asbestos-Cement (A-C) pipe in the system. This sample should be collected within the distribution system where A-C pipes are in place. Please do this test as soon as possible.

In addition to the above I have the following comments and recommendations:

1. A summary of your monitoring requirements can be found on page 12. Please maintain a copy of this page and refer to it for future scheduling.

2. Inorganics (excluding arsenic & nitrate) sampling schedules have been reduced to every nine years. You are welcome to sample more frequently.

3. The new well (L75346) will require plan review by our office prior to it being put into service. Please contact Marsha Fox at (971) 673-0408 as early as possible if you plan to use this well.

4. Contact your lab about measuring and recording the free chlorine residual on the lab slip at the time routine monthly coliform testing is done.

5. I recommend you do a pre & post coliform count test of your filter beds after each scraping to ensure that your ripening time is adequate. A slow sand filter is usually deemed ripened when total coliform counts of raw and treated are done and at least 95% removal has occurred in the filter.

6. You should collect raw water samples from the well and test them for coliform at least twice a year in order to confirm that the source is not contaminated with coliform. These samples should be marked "special" and do not need to be reported to the State.

7. If the operator does not use the written procedures that were produced when the water treatment plant was constructed, then he needs to create his own written procedure for operation of the water treatment plant for the purposes of preserving the information for future operators.

8. Since Fred Evers is performing the day to day operations of the water system and meets the qualifications, he should be designated as the DRC. Please fill out the enclosed "DRC Form" and return to the State Drinking Water Program, attention Dottie Reynolds.

If you have any questions or concerns, or would like this in an alternate format, please contact me at **(971) 673-0410.** Your cooperation is appreciated.

Sincerely,

Gregg Baird, REHS
Environmental Health Specialist
Drinking Water Program
www.oregon.gov/DHS/ph/dwp

encl: Tracer Study information
DRC Form

cc: Joseph Federico, Washington County Environmental Health

DHS Oregon Department of Human Services

Banks Water Department
Sanitary Survey
DHS Drinking Water Program

PWS ID: 41 00076
Survey Date: 04/24/08

Deficiency Summary

Surveyor: Kari Salis/Gregg Baird
Date Corrective Action Plan Is Due: June 30th, 2008 **County:** Washington

Yes	No	Deficiencies	Date to be Corrected	Date Corrected
☐	☒	**Source Deficiencies:** Well Construction:		
		Spring/Other Source:		
☒	☐	**Treatment Deficiencies:** Surface Water Treatment Deficiencies:		
		• Turbidimeters not calibrated per manufacturer or quarterly		
		• Incorrect location for compliance turbidity monitoring		
		Disinfection Deficiencies:		
		• Minimum CT requirement not met all times		
		• Failure to calculate CT values correctly		
		• No means to adequately determine disinfection contact time under peak flow and minimum storage conditions (need a tracer study).		
		• Create physical separation between untreated and treated water.		
		• pH, Temperature, and chlorine residual not measured daily at first user.		
		• Chlorine not measured and recorded as required.		
☐	☒	**Finished Water Storage Deficiencies:**		
☐	☒	**Distribution Deficiencies:**		
☒	☐	**Monitoring Deficiencies:**		
		• Well lacks current Radiologicals test.		
		• Lacking a current Asbestos test.		
☐	☒	**Management & Operations Deficiencies:**		
☐	☒	**Operator Certification Deficiencies:**		
☒	☐	**Other Rule Violations:**		

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OCT 2 2017
SALEM, OR

Comments: See letter dated May 12th, 2008 for details and comments/recommendations.

DHS Oregon Department of Human Services

Banks Water Department
Sanitary Survey
DHS Drinking Water Program

PWS ID: 41 00076
Survey Date: 04/24/08

Inventory and Narrative

County: Washington

Type	Status	Size	Season
☒ Community (C)	Population:	1434	☒ All year ☐ Seasonal
☐ Non Transient Non-Community (NTNC)	Connections:	675	Begins: (mm/dd) /
☐ Transient Non-community (NC)	Service Chars	MU	Ends: (mm/dd) /
☐ State Regulated (NP)	Ownership:	4	**Coliform Sampling**
	License		Period: ☒ Monthly ☐ Quarterly
	☒ Not Lic ☐ HD ☐ Ag		Samples Required: 2

Operator Certification Required
WD 2 WT 1 FE ☐ Small GW ☐

Responsible Agency
☒ State ☐ County ☐ Dept of Agriculture

Mailing Address:

Contact Name: Fred Evers
Phone: (503) 324-5112 ext. 201
Title: Public Works Superintendent
Cell: (503) 957-5354
Street Address: 100 S. Main St.
Emergency #: ( )
City/State/Zip: Banks, OR 97106
Email:

Legal/Owner Address:

Contact Name: City of Banks
Phone: (503) 324-5112
Title:
Cell: ( )
Street Address: 100 S. Main St.
Emergency #: ( )
City/State/Zip: Banks, OR 97106
Email:

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OCT 2 2017
SALEM, OR

Supply Address:

Contact Name:
Phone: ( )
Title:
Cell: ( )
Street Address:
Emergency #: ( )
City/State/Zip:
Email:

Emergency Systems Available:

Name:
PWS ID#: 41

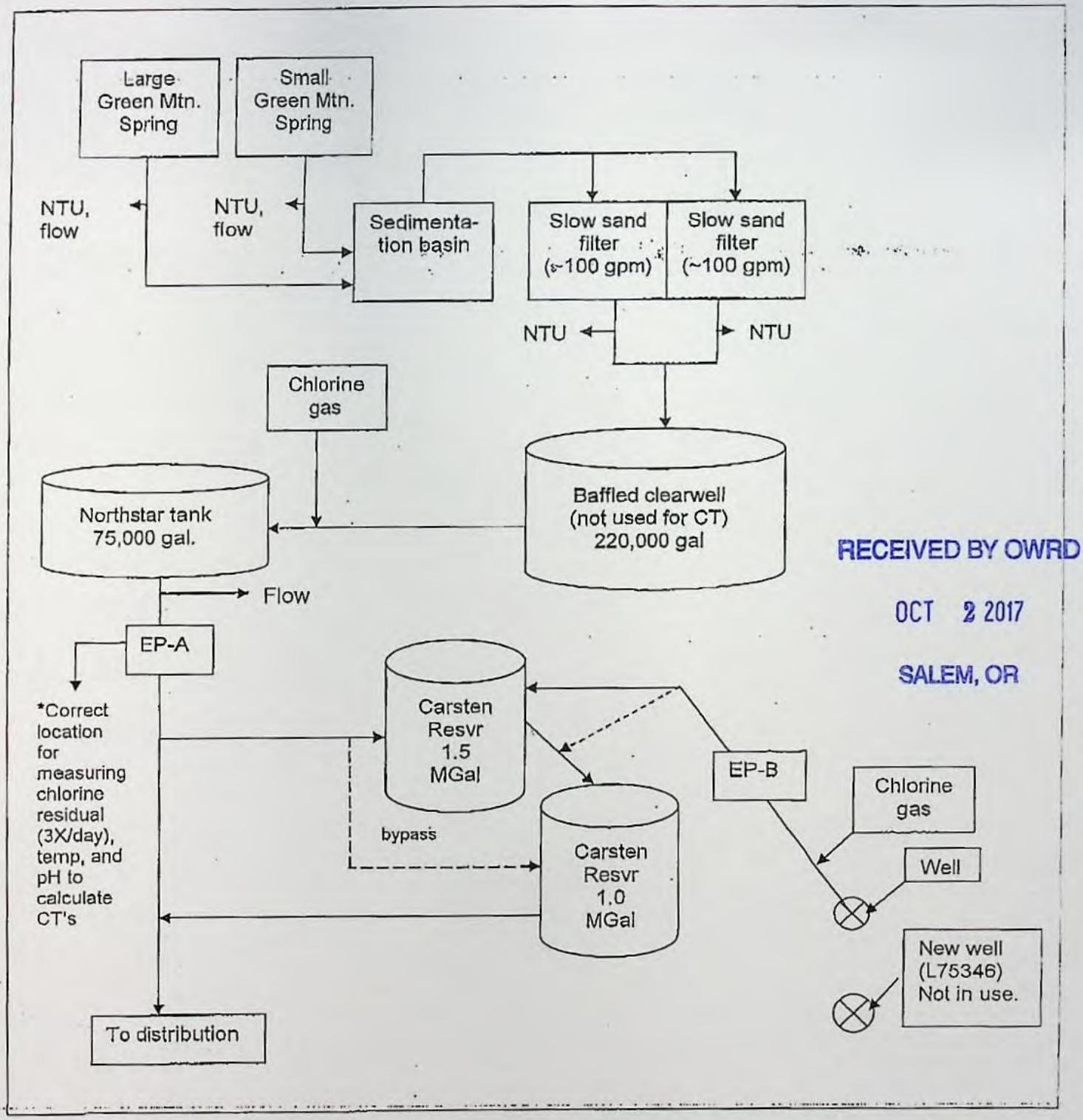
Narrative: This system serves the city of Banks located east of Hillsboro between HWY 26 and HWY 6. It consists of two entry points. EP-A is served by two spring sources that are classified as surface water. The spring water is treated by a slow sand filter, it then gravity flows into a 220,000 baffled tank next to the WTP, it then gravity flows down to the 75,000 gallon Northstar tank which is used for contact time (water is disinfected with chlorine gas prior to entering the Northstar tank). EP-B is served by a cased well that is treated with chlorine gas to provide residual maintenance. The well water is then pumped up the hill to the Carsten Road reservoirs (1.5 MG and 1.0 MG). The treated spring water is the primary drinking water source for most of the year (Fall-Winter-Spring). The well is used to manually fill the Carsten Road reservoirs as needed during the winter and is left on automatically during the summer when demand is highest.

DHS Oregon Department of Human Services

Banks Water Department
Sanitary Survey
DHS Drinking Water Program

PWS ID: 41 00076
Survey Date: 04/24/08

Water System Schematic



DHS Oregon Department of Human Services

Banks Water Department
Sanitary Survey
DHS Drinking Water Program

PWS ID: 41 00076
Survey Date: 04/24/08

Source Information

ID	Entry Points	Source Type					Availability					Treatment	
ID	(Location where water enters distribution and is sampled) Name	Ground	Surface	GWUDI	Pur. Ground	Pur. Surface	Permanent	Seasonal	Begins	Ends	Emergency	None	Treatment Codes
A	EP for Green Mtn Springs	☐	☒	☐	☐	☐	☒	☐			☐	☐	D403, P346, P660
B	EP for Well	☒	☐	☐	☐	☐	☒	☐			☐	☐	X401
		☐	☐	☐	☐	☐	☐	☐			☐	☐	
		☐	☐	☐	☐	☐	☐	☐			☐	☐	

ID		Individual Sources			Source Type					Availability			Treatment	
ID		(Contributing to Entry Point) Name	*Land Use	Capacity (GPM)	Ground	Surface	GWUDI	Pur. Ground	Pur. Surface	Permanent	Seasonal	Emergency	None	Treatment Codes
A	A	Large spring	K	165	☐	☒	☐	☐	☐	☒	☐	☐	☐	
A	B	Small spring	K	25	☐	☒	☐	☐	☐	☐	☒	☐	☐	
B	A	Well	G	250	☒	☐	☐	☐	☐	☒	☐	☐	☐	
					☐	☐	☐	☐	☐	☐	☐	☐	☐	
					☐	☐	☐	☐	☐	☐	☐	☐	☐	
					☐	☐	☐	☐	☐	☐	☐	☐	☐	
					☐	☐	☐	☐	☐	☐	☐	☐	☐	

*Land Use Codes: (A) Pristine Forest (B) Irrigated Crops (C) Non-Irrigated Crops (D) Pasture (E) Light Industry (F) Heavy Industry (G) Urban-Sewered Area (H) Rural On-Site Sewage Disposal (I) Urban On-Site Sewage Disposal (J) Rangeland (K) Managed Forest (L) Commercial (M) Recreational Use

List current operational patterns for all sources (e.g., Well 1 used continuously @ 100 gpm; Wells 2 & 3 used 6 hours/day; Well 1 used 30% of time & Well 2 used 70%; alternative use of Creek A & Creek B every 2 weeks; etc.). Be as specific as possible, and attach water use records if available.

- Springs are used at all times. During high demand, well kicks in. Small spring is only used when turbidity is <4 NTU (summer).

Yes No

☒ ☐ Does the water system have water rights for all sources? ☐ Not required) ____

☒ ☐ Has a Source Water Assessment been completed by DWP or DEQ? ____

☐ ☐ Delineation (include date) or USGS Location Map (name & number) attached/on file? ____

☐ ☐ Date of delineation or last update to delineation: ____ ☐ N/A

☐ ☒ Have there been any modifications to the existing well(s) or spring(s) (e.g. deepened, change in screened interval, springbox reconstruction, etc.). Describe below:

☐ ☒ Have there been any new high-use wells (e.g. irrigation, municipal, industrial, etc.) added within 1 mile of the existing source(s)? Provide direction and distance from system's well or spring and estimate use:

Comments:

DHS Oregon Department of Human Services

Banks Water Department
Sanitary Survey
DHS Drinking Water Program

PWS ID: 41 00076
Survey Date: 04/24/08

Treatment

Process Used*	Chemical Added**	Purpose	Location in System	Code***
Gaseous chlorination	Chlorine gas	Disinfection	WTP	D403
Filtration, Slow sand	NA	Particulate removal	WTP	P346
Sedimentation	NA	Particulate removal	WTP	P660
Gaseous chlorination	Chlorine gas	Disinfection	Well	X401

*See "Treatment Plant Inspection" page ofr details on filtration. **See "Disinfection" page for details on disinfection equipment. ***See Treatment Codes on back.

Yes / No

☒ ☐ Is equipment maintained properly?
☐ ☒ Is redundant equipment available?

What lab equipment is available and used? (jar testing, turbidimeter, pH meter, etc.):
Raw turbidity, turbidimeters on each filter bed and sedimentation basin. Chlorine analyzer, pH meter.

☒ ☐ • Are chemicals NSF Standard 60 Approved?
☒ ☐ Is operator aware of OSHA requirements for storage, handling, and spill containment?

Comments:

Yes / No

☐ ☒ Does System Practice Corrosion Control?
☐ ☐ • Is it operated within parameters set by OHD?

Comments:

Records Kept:

Yes / No		Yes / No	
☐ ☒	Dosages	☒ ☐	Flowrate
☐ ☒	Raw pH	☒ ☐	Treated pH
☐ ☒	Raw Temperature	☒ ☐	Treated Temerature
☒ ☐	Raw Turbidity and/or particle counts	☒ ☐	Treated Turbidity

Comments:

DHS Oregon Department of Human Services

Banks Water Department
Sanitary Survey
DHS Drinking Water Program

PWS ID: 41 00076
Survey Date: 04/24/08

Well Information

		Source ID#:	BA									
		Well Name:	Well									
			Yes No	Yes No	Yes No	Yes No	Yes No	Yes No	Yes No			
		Well Log on File:	☒ ☐	☐ ☐	☐ ☐	☐ ☐	☐ ☐	☐ ☐	☐ ☐			
Wellhead Construction		Depth of Well (ft.)	450									
		Depth of Grout Seal (ft.)	210									
		Year of Installation (yr.)	1977									
		Casing Diameter (in.)	8									
	•	Sanitary Seal & Casing Watertight	☒ ☐	☐ ☐	☐ ☐	☐ ☐	☐ ☐	☐ ☐	☐ ☐			
		Screened Vent	☒ ☐	☐ ☐	☐ ☐	☐ ☐	☐ ☐	☐ ☐	☐ ☐			
		Wellhead Protected from Flooding	☒ ☐	☐ ☐	☐ ☐	☐ ☐	☐ ☐	☐ ☐	☐ ☐			
	•	Well Meets Setbacks from Hazards	☒ ☐	☐ ☐	☐ ☐	☐ ☐	☐ ☐	☐ ☐	☐ ☐			
		Water Level Device	☒ ☐	☐ ☐	☐ ☐	☐ ☐	☐ ☐	☐ ☐	☐ ☐			
	•	Wellhead Terminates Above Grade	☒ ☐	☐ ☐	☐ ☐	☐ ☐	☐ ☐	☐ ☐	☐ ☐			
		Concrete Slab Around Casing	☒ ☐	☐ ☐	☐ ☐	☐ ☐	☐ ☐	☐ ☐	☐ ☐			
		Casing Height Above Slab (in.)	24									
		Pitless Adapter	☐ ☒	☐ ☐	☐ ☐	☐ ☐	☐ ☐	☐ ☐	☐ ☐			
		Protective Housing	☒ ☐	☐ ☐	☐ ☐	☐ ☐	☐ ☐	☐ ☐	☐ ☐			
Control Building		Flowmeter	☒ ☐	☐ ☐	☐ ☐	☐ ☐	☐ ☐	☐ ☐	☐ ☐			
		Pressure Gauge	☒ ☐	☐ ☐	☐ ☐	☐ ☐	☐ ☐	☐ ☐	☐ ☐			
		Pump to Waste Piping	☒ ☐	☐ ☐	☐ ☐	☐ ☐	☐ ☐	☐ ☐	☐ ☐			
	•	Raw Sample Tap	☒ ☐	☐ ☐	☐ ☐	☐ ☐	☐ ☐	☐ ☐	☐ ☐			
	•	Treated Sample Tap ☐N/A	☒ ☐	☐ ☐	☐ ☐	☐ ☐	☐ ☐	☐ ☐	☐ ☐			
		Heated/Lighted	☒ ☐	☐ ☐	☐ ☐	☐ ☐	☐ ☐	☐ ☐	☐ ☐			
		Floor Drain	☒ ☐	☐ ☐	☐ ☐	☐ ☐	☐ ☐	☐ ☐	☐ ☐			
		Pump Removal Provision	☒ ☐	☐ ☐	☐ ☐	☐ ☐	☐ ☐	☐ ☐	☐ ☐			
		Check Valve	☒ ☐	☐ ☐	☐ ☐	☐ ☐	☐ ☐	☐ ☐	☐ ☐			
		Air/Vacuum Relief	☒ ☐	☐ ☐	☐ ☐	☐ ☐	☐ ☐	☐ ☐	☐ ☐			
Pump Equipment		Pump Type*	VT									
		Pump Setting	0									
		Discharge Pressure (psi)										
		Horsepower (hp)	40									
		Bearing Lubrication (FG oil/water)	FGO									
		Pumping Capacity (gpm)	250									
		Static Water Level (swl) (ft.)	34									
		SWL Date	8/24/77									

* Pump Types: (VT) Vertical Turbine (SU) Submersible (CE) Centrifugal (SJ) Shallow Jet (DJ) Deep Jet (OT) Other

Comments: A new well has been drilled near the current well. The new well is capped, does not have a pump, and is not connected to the system. The new well is has an L-tag of L75346. This well needs Plan Review by this office prior to being put into use. Note: well water is pumped directly into Carsten Rd reservoirs where it mixes with spring water prior to going into the distribution system.

DHS Oregon Department of Human Services

Banks Water Department
Sanitary Survey
DHS Drinking Water Program

PWS ID: 41 00076
Survey Date: 04/24/08

Disinfection

No #.	Disinfection Method*	Location	Disinfection Source Water	Residual Maintenance	Proportional to Flow	Dosage Recorded
1	Chlorine gas	pre entry into Northstar tank	☒	☒	☒	☐
2	Chlorine gas	Well	☐	☒	☒	☐

*Chlorine Gas, Sodium Hypochlorite, On-site Generated Sodium Hypochlorite, Calcium Hypochlorite, Chloramines, Ozone, UV, Mixed-Oxidants, Other

Yes / No

☒ ☐ • Is a DPD type test kit used?

☐ ☒ • Are residuals recorded as required?

Distribution: ☒ Daily # samples: 1 ☐ Other:

Entry Point (sw only): ☒ Daily # samples: 1 ☐ Continuous if > 3300 pop

☐ ☒ If chlorinating for residual maintenance only, are raw water coliform samples taken? How often?

- Currently measuring daily at Northstar and Carsten reservoirs. Need to start measuring at least 3 times a day at the entry point (i.e. Northstar reservoir effluent).

Yes / No ☒ **Chlorine gas:**

Yes	No		Yes	No	
☒	☐	Separate room for gas storage and feeder?	☒	☐	Gas cylinders properly secured?
☒	☐	Fan with on/off switch outside?	☒	☐	Door that opens out
☒	☐	Vent located next to the floor?	☒	☐	Self-contained breathing apparatus?
☐	☒	Door with a window?	☐	☒	Air scrubber system?

CT Evaluation

Disinfection requirement (check one): ☒ (sw) 1.0 log inactivation giardia ☐ (sw) 0.5 log inactivation giardia ☐ (gw) 30 minutes contact time ☐ (gw) 4.0 log inactivation viruses

Maximum demand flow:

Effective volume calculation: (at lowest water level)

Minimum contact time: (estimated)

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Yes / No

☒ ☐ • Does contact chamber have effluent flow meter or adequate alternative?

If no, how is peak flow determined for CT calculations?

☐ ☒ • Has tracer study been conducted or adequate alternative?

Tracer Study Date: Demand flow:

Volume used: Results: minutes

Currently estimating. Need a tracer study on Northstar tank.

Describe alternate method to determine contact time:

Range of chlorine residual at first user: 0.54 to 0.71 at City Hall

Yes / No

☐ ☒ • (SW only) Are PH, Temperature, and chlorine residual measured daily at first user?

☐ ☒ • (SW only) Are CT values being calculated correctly? Not using CT tables; estimating required CT

☐ ☒ • Are CT values met at all times? Unknown b/c not calculating correctly

Comments: Recommend collecting raw water coliform samples from well at least twice a year.

DHS Oregon Department of Human Services

Banks Water Department
Sanitary Survey
DHS Drinking Water Program

PWS ID: 41 00076
Survey Date: 04/24/08

Alternative Technology Treatment Plant Inspection

☒ WTP inspection done with Sanitary Survey (Contact Code 1 and 1D)
☐ WTP Inspection only (Contact Code 1D)

WTP Name: TP for Green Mountain Springs WTP ID: A
Date of Inspection / Evaluation: 4/24/08
Plant Operator: Fred Evers Inspected by: Kari Salis/Gregg Baird
Total Points given: 20

Points	Visit Frequency	Check One:
Low range (0-15)	Every 3 years	☐
Mid range (16-25)	Annually	☒
High range (26 or more)	Every 6 months	☐

Comments: WTP needs to be inspected annually.

Source:

Describe Intake: Springs
Describe pumping facilities: Gravity
Watershed control information (protection plan, security measures, etc): Property is city owned.
Factors affecting water quality (algal blooms, logging, etc.):

General:

Treatment:

☐ Cartridge or Bag Filter Make / Model: ☒ Slow Sand Filter
☐ Membrane Filter Make / Model: ☐ Diatomaceous Earth
☐ Corrosion Control: ☐ Other:

Yes / No
☒ ☐ • Plan review approved? Any outstanding issues:

Log removal credit given: Giardia: 2.0 Crypto: 2.0 Date: w/ construction

Treatment Plant:

Yes	No		If No, select points
☒	☐	Is raw water turbidity data collected at least daily? ☒ On-line ☐ Bench-top Average raw water: 0.5 to 2.0 NTU Peak: 4.0 NTU	0
		Need install turbidimeter on Combined Filter Effluent (CFE) line prior to storage.	
☒	☐	• Are turbidity compliance standards met? (<1 NTU 95% of time; all < 5 NTU)	0
☐	☒	• Is CFE monitoring location acceptable (prior to any storage)?	5
☐	☒	Can chart recorder document turbidity > 5.5 NTU?	
		Currently measuring turbidity in town (says it's similar). Could add sample tap prior to tank. No chart recorder.	
☐	☒	• Are turbidimeters calibrated according to factory specifications or at least quarterly? **Calibrating 2X a year**	5
☐	☐	Are calibration standards valid (not expired)? **NOTE: Standards unavailable for inspection**	
☒	☐	Is flow through turbidimeter within manufacturer's range?	

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Banks Water Department
Sanitary Survey
DHS Drinking Water Program

PWS ID: 41 00076
Survey Date: 04/24/08

Alternative Treatment Plant Continued:

Yes	No		If No, select points
☐	☒	• Are CT's calculated correctly?	10
☐	☒	• Is contact time based on tracer study or adequate alternative?	
☐	☒	• pH, temperature and chlorine residual measured at 1st user?	
☒	☐	• Is there a flow meter on effluent side of clearwell?	

Currently taking pH, temp, Cl2 residual in town; will switch to outlet of Northstar tank (entry point effluent). Not using CT tables to calculate required CT. Violation of SWTR requires a Tier 2 public notice within 30 days.

☐	☒	Is corrosion control practiced?	
☐	☐	• Is it operated within parameters set by DWS?	0

Method of corrosion control used: NA

☒	☐	• Do all under-certified operators follow a written decision-making protocol as established by DRC? Just Fred	0
☒	☐	• Are standard plant operating procedures written and followed? O&M manual available for WTP - doesn't use.	0
☐	☒	Are operators on site during all hours of plant operation?	
☐	☒	☐ N/A If no, is there an alarm for low chlorine residual? •(>3300 Population only) ☐ Low chlorine ☐ High turbidity ☐ Plant shutdown ☐ Auto-dial	0

☒	N/A	**Bag / Cartridge Filtration:** Type of pre-filtration:	
☐	☐	• Pressure gauges before / after filter?	
☐	☐	Are filters changed based on pressure differential? At psid:	0
☐	N/A	**Slow Sand:** Scraping / Cleaning /Ripening protocol: Scrapes ~3 months. Ripening: fills, then returns filters to service next day (goes by turbidity, not pre/post coliform counts). See comments below.	
☒	NA	**Membrane:**	
☐	☐	• Particle counter or laser turbidimeter post-filtration?	0
☐	☐	• Is integrity testing done at least weekly? Method:	0

Backwash initiated by: ☐ turbidity: _____ ☐ TMP: _____ ☐ time: _____

☒	N/A	**DE:**	
☐	☐	Precoat process used? Describe:	0
☐	☐	• Is body feed added with influent flow?	0
☐	☐	Is DE discarded at end of filter run?	

Total Points 20

Comments: Recommend you do a pre/post coliform count test of your filter beds after each scraping to ensure that your ripening time is adequate. A slow sand filter is usually deemed ripened when total coliform counts of raw and treated are done and at least 95% removal has occurred in the filter.

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Survey Date: 04/24/08

Storage and Pressure Tanks

Number	Name	Tank Type*	Tank Material	Year Built	Volume (gal.)
1	WTP tank	G	Bolted steel	2002	220,000
2	Northstar reservoir	G	Concrete	1980	75,000
3	Carsten Rd (big "B" on the side)	G	Welded steel	1984	1.5M
4	Carsten Rd (pale blue)	G	Welded steel	1999	1.0M

* (G) Ground (E) Elevated (P) Pressure — Total Volume: ~2.8M

Reservoir Features	Reservoir Number: 1 Yes	1 No	2 Yes	2 No	3 Yes	3 No	4 Yes	4 No	Yes	No
Hatch: • Locked	☒	☐	☒	☐	☒	☐	☒	☐	☐	☐
Hatch: • Watertight	☒	☐	☒	☐	☒	☐	☒	☐	☐	☐
Hatch: Shoebox type lid (curbing)	☒	☐	☒	☐	☒	☐	☒	☐	☐	☐
Features: Drain to Daylight	☒	☐	☒	☐	☒	☐	☒	☐	☐	☐
Features: Overflow	☒	☐	☒	☐	☒	☐	☒	☐	☐	☐
Features: • Flap Valve (on drain and/or overflow)	☒	☐	☒	☐	☒	☐	☒	☐	☐	☐
Features: • Screened Vent	☒	☐	☒	☐	☒	☐	☒	☐	☐	☐
Features: Water Level Gauge	☒	☐	☐	☒	☒	☐	☒	☐	☐	☐
Features: Bypass Piping	☒	☐	☒	☐	☒	☐	☒	☐	☐	☐
Features: Fence/Gate	☒	☐	☒	☐	☒	☐	☒	☐	☐	☐
Features: Cathodic Plates Watertight ☒ N/A	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐
Features: Alarm for High/Low Levels	☐	☒	☐	☒	☐	☒	☐	☒	☐	☐
Maintenance: Exterior In Good Condition	☒	☐	☐	☒	☒	☐	☒	☐	☐	☐
Maintenance: Approved Interior Coating	☒	☐	☒	☐	☒	☐	☒	☐	☐	☐
Maintenance: Annual Inspection	☒	☐	☒	☐	☒	☐	☒	☐	☐	☐
Maintenance: Cleaning Schedule	☒	☐	☒	☐	☒	☐	☒	☐	☐	☐
Maintenance: Continuously Disinfected • (redwood only)	☐	☒	☒	☐	☒	☐	☒	☐	☐	☐
Plumbing Config.: Separate Inlet/Outlet	☒	☐	☒	☐	☒	☐	☒	☐	☐	☐
Plumbing Config.: Baffling	☒	☐	☐	☒	☐	☒	☐	☒	☐	☐
Plumbing Config.: Used for Contact Time	☐	☒	☒	☐	☐	☒	☐	☒	☐	☐

Hydropneumatic Tank	Number:			
Used for Contact Time	☐	☐	☐	☐
Accessible for Maintenance	☐	☐	☐	☐
Separate Inlet/Outlet	☐	☐	☐	☐
Bypass Piping	☐	☐	☐	☐
Access Port	☐	☐	☐	☐
Drain	☐	☐	☐	☐
Pressure Relief Device with Gauge	☐	☐	☐	☐
Air Blow Off Valve	☐	☐	☐	☐
Air Bladder/Diaphram	☐	☐	☐	☐
Valve for Adding Air	☐	☐	☐	☐
Water Level Sight Glass	☐	☐	☐	☐

Comments

WTP tank is not being used as designed for chlorine contact time. Northstar tank is where CT's are met.

If Northstar tank is used for contact time, then the tank bypass (and bypass of clayval) must be physically removed!

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Banks Water Department
Sanitary Survey
DHS Drinking Water Program

PWS ID: 41 00076
Survey Date: 04/24/08

Distribution System Information

Service Area and Facility Map

Yes ☒ No ☐ Does the system have a Service Area and Facility Map with the following features:

- ☐ Booster Pumps
- ☐ Pressure Reducting Valves
- ☐ Pressure Zones
- ☐ Sampling Points
- ☒ Sources-wells & withdrawal points
- ☒ Storage Facilities (reservoirs)
- ☒ Treatment Facilities
- ☒ Water Lines (including size and material)

Distribution Data

Yes	No		Comments
☒	☐	• System pressure >20 psi?	75-95 psi
☒	☐	System metered? (What %?)	100%
☐	☒	Water system leakage <10%?	12% estimate. Recommend calculating using meters.
☒	☐	Waterline depth > 30"?	
☒	☒	Piping looped?	
☒	☐	Hydrants or adequate blowoffs on all dead ends?	
☒	☐	Routine flushing? (How often?)	Every other year
☒	☐	Adequate valving?	
☒	☐	Routine valve turning?	Every other year

Comments:

Cross Connection Program (Community Systems Only)

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Yes	No		Comments
☒	☐	• Ordinance or enabling authority?	
☒	☐	List of installed devices?	
☒	☐	• Are devices tested annually?	
☒	☐	• Certified inspector (if serving more than 300 connections)?	Fred Evers

Comments: Testing done in the fall.

Booster Pumps

Number	Name (location)	Deficiencies Noted or Comments	HP	GPM	Aux. Power Yes	Aux. Power No
					☐	☐
					☐	☐
					☐	☐
					☐	☐
					☐	☐
					☐	☐

Comments:

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Banks Water Department
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Water Quality Monitoring

Contaminant	N/A	Frequency	Next Tests Due
Coliform Bacteria	☐	2 per month	ongoing
Nitrate	☐	WTP=annual. Well=annual	2008
Arsenic	☐	WTP=every 3 yrs. Well=annual	WTP=2010. Well=2008
Inorganic Chemicals (sw)	☐	WTP=every 9 years	2011
Inorganic Chemicals (gw)	☐	Well=every 9 years	2012
SOC's	☐	WTP=every 3 yrs. Well=every 3 yrs.	WTP=2008. Well=2010
VOC's (sw)	☐	WTP=annual	2008
VOC's (gw)	☐	Well=every 3 years	2010
Radiologicals	☐	See Below	
Asbestos	☐	Every 9 years	ASAP
TTHM's and HAA5's	☐	2 per quarter	ongoing
Lead and Copper, # 10	☐	Every 3 years	Summer 2008
TOC	☒		
Turbidity	☐	Daily	ongoing
Source Water Coliform	☐	Well=at least twice/year	
Other: Chlorine residual	☐	3 times daily before first user	ongoing

Yes No
☐ ☒ • Is all required monitoring current?

Comments: Well lacks current Radiologicals tests. Must do 4 consecutive quarters of Gross Alpha, Combined Radium 226/228, and Uranium. Note: WTP needs Combined Radium 226/228 every 6 yrs, Gross Alpha and Uranium every 9 yrs starting in 2008.

Yes No
☒ ☐ Has the system experienced chemical (last 5 years) or bacteriological (last 2 years) detections?
If yes, what contaminant and when? TCR = 8/9/07 & 11/2/07 (both not MCL's).

☒ ☐ • Have all MCL violations been addressed? NA

☒ ☐ Does the system have any monitoring reductions granted? Explain: WTP and Well have inorganics reduction to every 9 years.

☒ ☐ • Does the system have a written coliform sampling plan?

Does the plan include:

Yes	No		Yes	No	
☒	☐	Brief narrative	☒	☐	Rotation schedule?
☒	☐	Distribution map?	☒	☐	Repeat locations?
☒	☐	Sample site locations?			

Where in the system are the monitoring sites for TTHM and HAA5: (☐ Not required) DBPMAX01=660 S. Main DBPMAX02=42370 Lookover

☒ ☐ Are TTHM and HAA5 samples taken at location of maximum residence time?

Comments: Need to do an Asbestos test as soon as possible since have some A-C pipe in the system.

DHS Oregon Department of Human Services

Banks Water Department
Sanitary Survey
DHS Drinking Water Program

PWS ID: 41 00076
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Management & Operations

Management Operations

☒ ☐ • Does system have an operation and maintenance manual?
☒ ☐ • Does system have an emergency response plan?

Operator Certification

Requirements for system: WT: 1 WD: 2 Small System: ☐

Name	Certification Number	WT Level	WD Level	FE	Small System
DRC;*Todd F. Evers	6149	3	2	☐	☐
Fred A. Evers	3645	1	2	☐	☐
				☐	☐
				☐	☐
				☐	☐

*DRC= direct responsible charge. Attach additional sheets if necessary to list all certified personnel.

Yes No
☒ ☐ Is DRC identified?
☒ ☐ • Is DRC certified at appropriate level?
☐ ☒ • Does system have written operating protocols for other operators? NOTE: Fred is only operator.

If DRC is a Contract Operator:
Yes No
☐ ☐ Does DWP have contract on file?

How does contract operator work with system: NA

Plan Review/Master Plan

Yes No
☒ ☐ • Have all major modifications (since 8/21/81) been approved by DWP?
☐ ☒ Does system have a current plan review exemption for water main extensions?
☒ ☐ • Does the system have a current (<20 yr. old) master plan? (☐ Not required if < 300 connections)
What year was the plan completed? 1998; update to 1995 plan
☐ ☒ Does the master plan include a water conservation plan?

Compliance Status

Yes No
☒ ☐ • Is water system in compliance (all orders resolved and not a significant non-complier)?
How many violations has the system had in the past two years. 2
☒ ☐ • Does the system issue Public Notice for Violations as required?

Other
☒ ☐ Has a capacity assessment been completed by DWP?

If yes, list deficiencies noted: 8/16/00: need third round LCR, ERP, X-Conn plans.

☒ ☐ • Are consumer confidence reports sent to users each year?

Comments: Fred needs to be switched to being the DRC. He is qualified and is doing all the daily operation of the WTP and system.

Tracer Study Procedures

Continuous Feed or Step-Dose Method

The purpose of a tracer study is to determine the actual amount of contact time provided in the system during peak flow conditions and minimum contact volume, from the point of disinfection to the first user. Estimates can be calculated, but the degree of short-circuiting is only approximately known unless a tracer study is conducted.

Step 1: The test must be conducted during the **peak demand flow** on the system. Important: this is the peak flow leaving the reservoir or contact chamber, which is not necessarily the same as what comes from the well or through the filtration plant. The study can be done at the known peak flow time (in the morning or early evening), or the effluent pumps can be set for peak flow, if possible. It is also important that the study be conducted **when the reservoir or contact chamber is at the lowest level,** to represent the worst-case scenario.

Step 2: Choose a chemical to use. It is easiest to use something on hand already. Common choices are chlorine or fluoride. Make sure the proper testing equipment is available (chlorine or fluoride test kits).

Step 3: Prepare the data collection sheets in advance. Include columns for time, concentration, a space for the background concentration, and applied concentration.

Step 4: The tracer study parameters and procedure proposal should be submitted to and approved by the Drinking Water Program prior to conducting the study.

Step 5: If using a chemical that already exists in the system at background levels (e.g., chlorine), record this background dosage and residual at the first user before beginning the study.

Step 6: Set the time for zero when the concentration of the tracer study chemical is applied at the normal point of injection for disinfection. This concentration must be consistent at all times throughout the study.

Step 7: Record the concentration of the tracer study chemical at the first user and the time. Tests should be done every minute or so, perhaps as frequently as possible. When the concentration increases by 10% of the additional concentration added, this is used as the contact time. For example, if the system normally is chlorinated at 0.5 ppm and during the tracer study it is increased to 2.5 ppm (a difference of 2.0 ppm), the increase you would be looking for is 10% of 2.0, or 0.2 ppm. So in this example, when the residual reaches 0.7 (0.5 + 0.2) ppm, that is the contact time provided. It is best to continue testing the concentration to make sure it was a good reading and the concentration indeed is increasing as time goes on. Sometimes the concentration may inexplicably go up and down before it consistently increases.

Step 8: Keep records of absolutely everything that was done, for future reference. A written report of procedures should accompany all data to justify the conclusion of the tracer study (the actual contact time).

Step 9: Submit the tracer study results to the County Health Department and DWP for review and approval.

For further information and details, contact DWP or refer to EPA's SWTR Workshop Manual or AWWA Research Foundation's Tracer Studies: Protocol and Case Studies.

Tracer Study Parameters & Results

Water System Name: _____ ID#: _____
Date of Tracer Study: _____

Contact Volume:

Volume of Clearwell when Full: _____ gal (a)
Water level height when full: _____ ft (b)
Minimum water level height: _____ ft (c)
Minimum Volume of Clearwell (a x c / b): _____ gal (d)
Volume or height at time of tracer study*: _____ (e)
* Note: Must be within 10% of minimum volume
Additional contact volume in pipe: _____ gal (f)
Total volume used for tracer study
(to 1st user): _____ gal (g)

Flow Conditions:

Peak flow at contact chamber effluent: _____ gpm (h)
How is peak flow determined? ___ flow meter at effluent
___ pump rates
___ other _____
Flow at time of tracer study: Beginning: _____ gpm
End: _____ gpm
Average*: _____ gpm (i)

* Note: Flow (i) during tracer study must be at leastn 90% of peak flow, or 0.9 x h
Note: Tracer study must be repeated when peak flow increases by 10%
Repeat tracer study when peak flow is: 1.1 x (i) = _____ gpm (j)

Tracer Chemical:

Which chemical is to be used?
___ Chlorine compound ___ Fluoride compound
___ Other _____
Initial concentration: _____ (k) Dosage conc.: _____ (L)
Target concentration at 1st user: k + [0.1 x (L-k)]= _____ (m)

Results:

Minimum
Time for target concentration to be reached: _____ min (n) **Contact Time!!**
Baffling factor = (n x l) / g = _____ (o)
Note: Baffling factor may be used when volume is greater or flow is less than in study

Name: _____

Signature: _____ Date: _____

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Worksheet for Tracer Study

Addendum to "Tracer Study Parameters and Results" Page

Water System: ______________________ Date: ____________

Time	Concentration (ppm)	Comments

Department of Human Services

Drinking Water Program

Water System Operator Designation
DRC Form

If you need this information in an alternate format, please call Operator Certification at (971) 673-0413

System:

PWS #:

Required Certifications:

Distribution Level
Treatment Level
Filtration Endorsement
N= None Required

Previous DRC: _____

Indicate the reason for the change: ☐ Retired ☐ New job duties ☐ No longer employed ☐ Other

New DRC DISTRIBUTION	TREATMENT
Name:	Name:
Cert #: Level:	Cert #: Level:
Signature:	Signature:

Does this system contract for a certified operator? YES___ NO___

If **YES** submit a copy of the contract and complete the information below

Name of Business: _____

Name of Operator: Cert. #

Address:

Phone: Signature

This contract is for: Distribution___ Treatment___ Both___

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I am the owner or legal representative for the water system. I have reviewed the information on this form and verify that it is true, complete, and accurate to the best of my knowledge.

Signature: _____ Title: _____

Printed Name: _____ Phone _____ Date: _____

Send completed form (with copy of contract, if required) to:
Operator Certification • DHS-Drinking Water Program • PO Box 14450 • Portland, OR 97293-0450

Operator Designation Information on back of form

10/07

Direct Responsible Charge Information

Pursuant to OAR 333-061-0225 the water system owner or authorized agent delegates the responsibility to the certified operator(s) listed below of:

- Supervising the technical operations of the system, and
- Establishing and executing specific practices and policies for operating the system in accordance with policies and practices of the owner and the requirements of public water system rules, and
- Are engaged in the actual day-to-day operation and/or supervision of the system.

The principal operator must hold a current, valid Oregon certificate at a grade level equal to or greater than the system's classification level.

Water systems contracting with a certified operator must include name and address of company/individual the contract is with. A copy of the contract must be submitted with this form.

Requirement: All Community and Non-Transient Non-Community Public Water Systems are required designate and notify the Drinking Water Program (DWP) of the certified operators designated for each Treatment Plant and Distribution System. The Operator Designation Form is to be submitted by the Public Water System to notify the DWP of any designations or changes. Per Oregon Administrative Rules, this form shall be submitted within 30 days after any change so that the system is not in violation of operator certification regulations. Certified Operators should ensure that this form is submitted if they are no longer the operator for a system so that the DWP does not continue to hold them responsible for the system's operation.

Visit the DWP, Operator Certification Web site, for additional information at www.oregon.gov/dsh/ph/dwp

Water Treatment Facility
Disinfection Contact Time Tracer Study

City of Banks
Washington County, Oregon

Test Date: May 15, 2008

Provided by the Oregon Department of Human Services, Drinking Water Section as part of the Circuit Rider Technical Assistance Program

Prepared By:

H B H
Consulting
Engineers

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Suite 101
Sherwood, Oregon 97140
503.625.8065
fax 503.625.1531

486 E Street
Suite 3
Coos Bay, Oregon 97420
541.266.0355
fax 541.266.7504

Date of Site Visit: May 15, 2008 PWS ID: 41-00076
HBH Staff: Robert Henry, PE

Description of Facilities

The City of Banks owns and operates a water treatment plant to treat surface water (springs) for municipal use and domestic consumption. The city treatment plant is a slow sand filter. Following filtration, water flows to a 75,000-gallon, concrete reservoir, where chlorine (gas) is added. The water flows though the unbaffled reservoir, then though approximately 1/2 mile of 6-inch pipe before reaching the first user.

Testing Procedure

Test Point
The sample point for this test was a sample tap adjacent to the first user's meter.

Test Flow Level
The accepted EPA method of determining contact time is to measure the travel time through the contact basin and transmission piping at peak flow. The maximum flow from the treatment plant is held to 120 gpm by a flow-control valve near the city (peak flows are taken care of through reservoir storage and supplementation from the city well).

Clearwell Configuration/Level
The "clearwell" is the 75,000-gallon reservoir. This reservoir is unbaffled. The normal minimum operational level for the reservoir yields a minimum volume of 66,700 gallons. This level is 2 feet from the top of the tank.

Chlorine Dosage
Prior to beginning the test, the target chlorine residual leaving the treatment plant was 0.83 mg/L. With chlorine demand exhausted, an increase of 1.2 mg/L of chlorine dosage was used to provide the tracer concentration.

The accepted EPA method of determining contact time is to use the time at which 10% of the added tracer concentration reaches the sampling point (T_{10}). During the test, a residual increase of 1.2 mg/L was added to an initial residual concentration of 0.83 mg/L. The 10% increase concentration (C_{10}) is therefore 0.95 mg/L as shown in the following calculation:

C_{10} = initial mg/L + 10% (added residual)
C_{10} = 0.83 mg/L + 0.1 (1.2 mg/L)
C_{10} = 0.95 mg/L

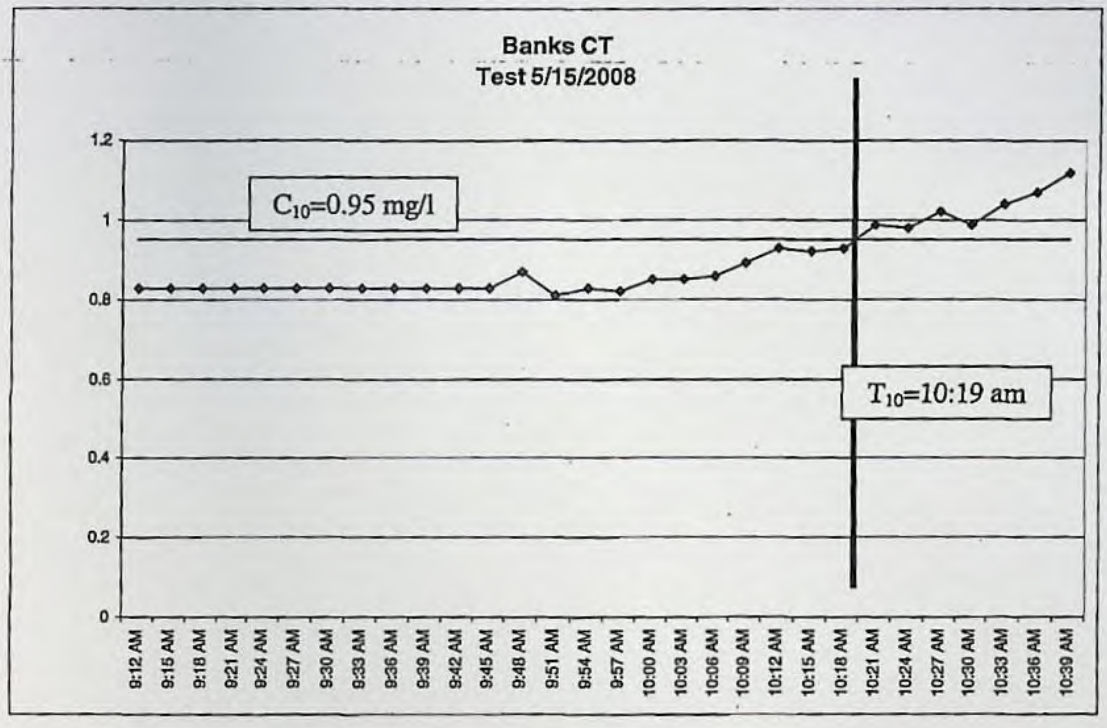
Measured Contact Time

The chlorine dosage was increased at 9:12 AM, starting the test. As can be seen in Figure 1, the time at which the C_{10} concentration was reached was 10:19 AM or **67 minutes** after the dosage was increased.

Appendix B

Disinfection Contact Time Tracer Study

Figure 1 – CT Tracer Test Results (11-28-07)



Calculated CT

The product of the free chlorine residual concentration (mg/L) and the contact time (min.) is termed "CT". CT tables have been developed to allow operators to determine the CT value required to ensure adequate disinfection. The required CT value depends on the water temperature, pH, chlorine residual, and the log-reduction required. Actual achieved CT must be greater than the required CT. The maximum CT required for the City of Banks would be **58** (assumes most conservative values of Temp = 5.0 degrees-C, pH < 7.5 and 1.0-log inactivation of giardia cysts).

The residual of 0.8 is typically used. During times matching the test conditions the contact time is **67 minutes**. The CT available in this case is **53.6** [0.8 mg/L x 67 min.].

Conclusions

Based on the current operational strategy, the City of Banks does not have sufficient contact time for the worst-case scenario (Temp = 5.0 degrees-C, pH < 7.5). However, the temperature is rarely lower than 8 degrees-C. When the temperature is 10 degrees-C, the required CT is 44. The City meets the required CT under these conditions. ***Based on the contact tracer study, it is recommended that when water temperatures are <u>below</u> 10 degrees-C, the City of Banks increase the residual chlorine concentration to 1.0 mg/l.***

Appendix C

Amendment #1 – Water System Flow Control

27 July 2011

Technical Memorandum

To: Jim Hough – City of Banks

From: Gordon Munro – Kennedy/Jenks Consultants
Erik Hoovestol – Kennedy/Jenks Consultants

Subject: City of Banks – Water System Flow Control Evaluation
K/J 0791015*12

1.0 Introduction

Kennedy/Jenks Consultants (Kennedy/Jenks) was authorized by the City of Banks (City) to investigate opportunities to increase the efficiency and reliability of the operation of the Banks Water System and prepare an updated Water System Capital Improvements Plan (CIP). The focus of the investigation is flow control through the system from the springs to the Carstens Reservoirs. This memo presents the findings of this effort along with recommendations. Efforts into this study included several site visits and many discussions with City staff as well as Frost Engineering, who maintains the City's current SCADA system.

The attached Figure 1 shows a schematic of the City's water system and the location of proposed features and existing features relevant to this study.

Flow through the facilities from the springs to the Carstens Reservoirs is by gravity. The design plans for the various elements show flow control elements that were either never installed or taken out of service. The flow control points in the system consist of the following:

- flow into the slow sand filter (SSF) treatment plant;
- flow out of the SSF and into the chlorine contact tank;
- flow out of the chlorine contact tank and into transmission pipe;
- flow through the pressure reducing valve (PRV) at the North Star Reservoir site and into the upper pressure zone;
- flow through a second PRV on Sellers Road and into the main pressure zone;
- flow into the Carstens Reservoirs.

The key issues are:

- controlling the flow into the slow sand filters to maximize water production and operator efficiency;
- controlling the flow from the SSF to the chlorine contact tank such that the treatment is not compromised, and maximizing the flow from the springs;
- controlling the flow out of the chlorine contact tank to allow for adequate disinfection and provide flow into the distribution system;
- keeping the 40 customers on the transmission line supplied with water during filter changes.
- setting the PRV's to provide appropriate pressure and maximize flow from the springs;
- controlling the flow into the Carstens Reservoirs to maximize the flow from the springs, but avoid overflowing the reservoirs.

2.0 Clearwell Outlet Flow Control

The State of Oregon requires that surface waters, such as that from the springs, have a minimum amount of disinfection time after chlorine is added before it can reach the first customer. This is referred to as chlorine contact time. The Clearwell built in 2002 next to the SSF was installed primarily for this purpose but has not been utilized for chlorine contact time. However, it will be used for chlorine contact after the current water system improvement project is completed.

The amount of time the water is retained for contact time is a function of the volume of water in the Clearwell and the flow rate of water through the Clearwell. The contact time required is a function of the chlorine concentration, the log inactivation required (which is based upon the treatment system employed) and the temperature. If the actual contact time is less than the required contact time, then the water will be insufficiently disinfected and "boil water notices" will need to be sent out.

Based upon our calculations the minimum level in the Clearwell for a flow maximum flow rate of 270 gpm would be 10.4 ft. Lower flow rates will require less volume of water in the Clearwell. This can be achieved by controlling the flow out of the Clearwell and/or controlling the water level in the Clearwell to maintain a minimum volume.

Although the original construction plans for the Clearwell showed a flow control valve on the outlet of the tank, for reasons unknown it was never installed. We are proposing to install a

valve to limit the flow of water out of the tank and thus maintain an appropriate contact time for disinfection. The valve will be a modulating butterfly valve installed in the existing vault with the flow meter next to the Clearwell. The settings on the valve will be adjustable remotely so the operators do not have to enter the vault to change the settings. The flow rate will correspond to a minimum operating level of the Clearwell. A table showing flow rates and the corresponding Clearwell levels will be provided to the operators.

This valve should not be adjusted below 100 gpm to insure that the 40 customers connected to this line are adequately supplied during peak hourly demand times of the day such as early morning and evening.

During the summer the actual flow available from the springs may be less than 100 gpm. If it is less, the valve setting should be adjusted down to the available flow.

Estimated Cost, Clearwell Outlet Control Valve

Valve	$4,500
Installation	$500
Electrical	$500
Engineering	$2,500
SCADA and PLC Programming	$1,000
Contingency	$1,000
Total	**$10,000**

This valve should be installed as part of the water system improvements project along with the associated electrical and controls. Engineering includes adding the valve to approximately 4 sheets, preparing specifications, and adding the flow feature to the controls strategy. Pending timing with the upcoming project, this work could be done prior to bidding, during bidding by addendum, or by change order during construction.

If not included in the upcoming project, the costs would be higher due to separate bidding and contracting requirements.

2.1 Clearwell Inlet Valve

There are two events that need to be controlled to prevent the Clearwell from overflowing. First, when the demand is low enough that the Clearwell fills. Second, when the Carstens reservoirs are full which will in turn cause the water to backup into the Clearwell. The resulting discharge of chlorinated water to the local stream is environmentally undesirable.

Memorandum

A simple on/off actuated butterfly valve on the inlet line between the SSF and the Clearwell is proposed that will shut when the Clearwell is full. The valve could be installed in the metering vault already included in the current water system improvement project. If this valve is closed for a long enough time period, the SSF will be allowed to overflow. There is existing piping to accommodate the overflow of water from the SSF and return the water to the stream. The water from the SSF is not chlorinated and therefore is not an environmental risk if it is returned to the stream. The overflow water does not pass through the sand filter so filter maintenance costs are not affected.

It is recommended that this valve be installed as part of the water system improvement project. If it is decided not to proceed initially with the installation of this valve, it is recommended that provisions in the electrical and controls system should be made during construction in the upcoming Water System Improvements Project to allow for installation of the Clearwell Inlet valve after the testing period for the increased flow rate of the SSF. Provisions would involve installing conduit and preserving space in the SCADA display screens. These provisions should only total a few hundred dollars and could most easily be done by a change order during construction and changes made to the as-built drawings.

Estimated Cost, Clearwell Inlet Valve

Valve:	$4,200
Installation	$500
Electrical	$200
Engineering	$1,000
PLC Programming	$ 300
Contingency	$ 700
Total	**$6,900**

If not included in the upcoming project, the cost would be significantly more as there would need to be separate bid documents, bidding, and construction.

2.1.1 Transmission Line Flow Control

During filter cleaning episodes, one of the two sand filters is taken off line. During filter changes the level in the Clearwell may lower to unacceptably low levels if the remaining filter cannot keep up with the minimum flow setting of 100 gpm.

Under these circumstances the system needs to be able to provide 100 gpm to the upper pressure zone for potential peak demands, and limit the flow from the upper pressure zone into the Carsten reservoir to reduce the total demand supplied by the springs. . Providing a valve to control the amount of water going into Carstens Reservoirs would allow the operators the

flexibility to reduce the flow rate leaving the Clearwell during filter changes and to insure water to the customers located on the transmission main.

The best location for this valve would be at inlet valve vault at the Carstens Reservoir site. The vault has existing electrical conduit to the control panel that is being used for the existing flow meter that could be utilized. The valve would be a modulating butterfly valve and could be controlled remotely via the SCADA system. The valve could be programmed such that it would not close all the way in order to prevent over pressurizing the segment of the transmission line between the Sellers Road Valve and Carstens Reservoirs.

Estimated Cost, Automated Inlet Valve

Valve	$4,500
Installation	$500
Electrical	$500
Engineering	$1,000
SCADA and PLC Programming	$1,000
Contingency	$1,000
Total	**$8,500**

As a lowest cost option, a manually operated butterfly valve installed by City crews could be installed for approximately $1,000 for materials (valve, coupling, and valve can). This would be a buried butterfly valve and operated from the surface using a typical valve wrench and will require the operators to adjust as needed during filter changes. Adjusting the valve to the desired flow rate could be time consuming at least initially and there is risk that the valve could be closed all the way and cause the segment of the transmission line from the Sellers Road Valve and the Carstens Reservoirs to over pressurize.

It is recommended that the automated valve be installed with the water improvement project.

2.1.2 Slow Sand Filter Inlet Control

Previously, the flow rate from the springs were adjusted up at the Large Green Mountain Springs and required the operators to drive up to the springs, adjust the valve and come back to the SSF and see if their manual adjustment was correct and repeat as necessary. As part of this study it was learned that the operators can adjust a valve inside the SSF pipe gallery and this has increased operator efficiency greatly.

Memorandum

Jim Hough – City of Banks
27 July 2011
0791015.12

The flow into the filters from the springs is now controlled by manually adjusting a gate valve from the Large Green Mountain Springs inside the filter room gallery. The operators rarely need to make more than one adjustment per day. The valve for the Small Springs line is not typically adjusted.

Automated butterfly valves were at one time installed on both the Large and Small Springs lines and were reportedly set to automatically shut down when the turbidity from the springs was too high. These valves are not currently operational as they lack power conductors and controls programming. They have simple on/off actuators that may or may not still be functional.

Currently, adjustments for controlling flow to the filters is done by adjusting the valve from the Large Springs inside the SSF. Automating the valve on the Large Green Mountain Springs line with a modulating actuator and connecting it to the SCADA and PLC programming so that adjustments could be made remotely would only slightly increase operator efficiency, and possibly provide for slightly more efficient operation of the SSF by keeping the water levels and resulting throughput at maximum levels. The valve would be adjusted by operator set points and controlled by the flow rate and the level of the water in each of the slow sand filters.

Due to the typical low flow rates from the Small Springs, no automated controls are recommended on the influent line from the small springs. Currently, adjustments for controlling inflow to the filters are done with adjusting only flow from the Large Springs.

It would be most cost effective to have this valve installed during the upcoming water system improvements project.

Estimated Cost, Slow Sand Filter Inlet Valve

Actuator:	$1,500
Installation	$ 500
Electrical	$ 500
Engineering	$ 500
SCADA and PLC Programming	$1,000
Contingency	$ 500
Total	**$4500**

If not included in the upcoming project, the costs would be higher due to separate bidding and contracting requirements.

Due to the limited benefits and cost of this valve, Kennedy/Jenks and City staff concur that it is not required as part of the water improvement project. The City may want to consider

installation at a later date in order to provide control capability during times when access to the SSF site is impaired.

3.0 Water Production Efficiency

Water produced from the springs and SSF is approximately 35% less expensive than the water produced from the wells mainly due to the lower power costs than pumping from the wells; therefore, efforts should be made to maximize flow from the SSF and decrease the need for water pumped from the wells.

The City currently has water rights for a total of 270 gallons per minute (gpm) from the Large Springs and Small Springs. Currently only about 120 gpm or 44% of this is utilized on an annual basis. The Large and Small Springs reportedly have a minimum summer flow rate of about 90 gpm and 20 gpm respectfully with ample additional water reportedly available during the remainder of the year. However, the flow rate available during the rest of the year has not been verified or documented.

The amount of water that can be used from the springs is currently limited by the size (and associated chlorine contact time) of the existing 70,000 gallon Northstar Reservoir. The State of Oregon has limited the flow rate through the Northstar Reservoir to 120 gpm . After the point of chlorination is moved to the 220,000 gallon Clearwell next to the SSF, as is currently planned for in the current Water System Improvement Project, this limitation will be absent. The flow rate out of the Northstar Reservoir is currently partially controlled by manually adjusting the Sellers Road Valve.

The Clearwell and the volume in the piping from the Clearwell to the North Star site has the disinfection contact time capacity for 400 gpm. However, the actual flow rate is limited to 270 gpm by the water right.

The output of the system is limited by the existing valving at the SSF. The 1998 Water System Master Plan Update suggests that the filters were conservatively designed for a maximum flow rate of 100 gpm each and reports that by removing the inserts on the effluent control valves the maximum flow rate could be increased to 150 gpm each. Again, this would need to be limited to a total of 270 gpm based upon the current water right. This flow would likely be only achievable immediately after cleaning. Current maximum flow rates after cleaning are limited to 100 gpm maximum by the valving and as the filters become partially clogged the flow rates go down to about 60 gpm before cleaning.

The State of Oregon has no requirements on maximum flow rate through the filters and is only concerned that the required turbidity levels are reached. In the last Sanitary Survey, the State reported that the current flow rate of 0.065 gallons per minute per square foot (gpm/sf). falls well within commonly accepted range of .03 gpm/sf to 0.10 gpm/sf. Assuming an optimistic

increase to a maximum of 135 gpm per filter, we would still fall within this range with a flow rate of 0.088 gpm/sf which is still within the commonly accepted range.

Due to many factors, the true capacity of the filters can only be determined by actual trial runs. We recommend removing the inserts in the existing valves and increasing the flow rate on a trial basis in incremental steps over a period of up to a year in different types of influent turbidity to evaluate the performance of the SSF at higher flow rates. If it is found that significantly higher flow rates can be achieved, then proceed with installing the following items which are discussed in more detail below:

1. The new multifunction altitude valve at Carstens Reservoir.

2. The low flow bypass at the Sellers Road Valve.

The total cost of the additional valving required to accommodate an increase in flow from the SSF is approximately $4,000 without engineering support. It is assumed that the work can be done by City staff. Additional engineering support may be needed to assist operators with maximizing the flow from the slow sand filters and analyzing filter cleaning down time frequency verses water production. The level of support is uncertain at this time; however, a place holder of $2,000 is included for planning purposes. Table 1 below presents the potential payback period for the cost of the valves at different lfow rates of increased SSF production and utilizing more of the less expensive water from the SSF instead of using the more expensive well water.

Table 1

Increase in Average Flow Rate per Filter	Total Increase in Flow Rate from the Slow Sand Filter	Annual Savings	Potential Pay Back Time $4,100 (years)*
10	20	$894	6.7
25	50	$2,235	2.6
50	100	$4,470	1.3

*Assumes power cost for pumping from the wells verses filter cleaning labor costs at the SSF. Labor cost per gallon at SSF is constant.

3.1 Carstens Reservoirs Valve

Currently there is no automatic valving to shut off the flow of water from the SSF into the Carstens Reservoir to prevent overflow. Overflowing of the reservoir presents two concerns. One is that the City is wasting treated water, and the other is that treated water with small amounts of chlorine will flow into the stream by the Behrman Wells and pose an environmental issue.

The altitude valve that was originally designed and installed to prevent overfilling has been removed. It was removed to prevent over pressurizing the segment of pipe between the existing PRV station and the Carstens Reservoirs and the 10-12 customers between the Sellers Road Valve and the Carstens Reservoirs. The valve was designed to close when the reservoir fills which could potentially over pressurize the segment of pipe between the Sellers Road PRV Station and the Carstens Reservoirs. Additionally, the valve did not allow for water to flow backwards from the reservoir to supply water to the customers between the Carstens Reservoirs and the Sellers Road PRV station should the Sellers Road valve close.

The Behrman Well pumping records and Carstens Reservoirs levels were reviewed and it was found that with current flow rates from the SSF, the Carstens Reservoirs do not overflow despite no control of the flow into the reservoirs from the SSF. The town currently uses slightly more water on the lowest use days than is currently provided from the SSF. Increasing the flow rate from the SSF will increase the likelihood of the Carstens Reservoirs overfilling during low water consumption periods.

We recommend installing a two way flow altitude valve with a pressure relief override if it is proved that the capacity of the slow sand filters can be significantly increased. The valve will function automatically with no need for electronic controls. This multifunction valve will prevent overfilling of the reservoirs, allow flow back from the reservoirs to customers located between the Sellers road valve and the Carstens's Reservoir, and prevent the line from over pressurizing. The existing valve (which is laying in the corner of the vault) could be refurbished and have the additional reverse flow and pressure relief features added.

Reinstallation of this valve would most effectively be done by City staff without the need for engineering design plans or contractor installation. The refurbishing, addition of features, and start up could be done on site by the factory technician. If the work is done differently, the cost will be higher.

Estimated Cost: $5,000 -new valve

Estimated Cost $3,000 -refurbishing and modifying existing valve.

3.2 Sellers Road Valve Low Flow Bypass

The Sellers road valve consists of a valve in a vault that has a pressure sustaining function for the water above the valve and a pressure reducing function to reduce pressure below the valve. As discussed above, when the flow into Carstens Reservoir is stopped, the only remaining flow would be to supply the 10 or 12 customer located on the transmission line. The valve manufacturer reports that the existing 3-inch diameter valve can be damaged and not function properly during low flow events. Installation of low flow bypass piping and valve inside the existing vault with a one inch pressure sustaining and reducing valve and piping is

recommended. Installation of this valve would most effectively be done by City staff without the need for engineered design plans or contractor installation. A manufacture's technician would assist with the initial settings on the new by- pass valve. Adjustments in the settings of this valve and the new Northstar pressure reducing valve will need to be made to accommodate the additional flow rate.

Estimated Cost: $1,000

4.0 Summary and Recommendations

Kennedy/Jenks Consultants recommends that the following items be added to the current Water System Improvements Project:

1. Clearwell Outlet Control
2. Clearwell Inlet Control
3. Transmission Line Control into Carstens Reservoirs

The estimated cost for these improvements is $25,400 if they are done with the water improvement project. Since the project is currently out to bid, the City may want to consider waiting until bids are in and evaluate the project budget at that time.

It is not recommended to provide additional automated controls for the inflow to the slow sand filters.

After completion of the SSF Capacity study, assess the need for:

1. Carstens Reservoirs Multifunction Altitude Valve
2. Sellers Road Valve Modifications

The estimated cost for these improvements is $6,000 if the construction is done by City Staff as a maintenance item.

The water system can be operated as it has in the past with manual control in some cases and no control in other cases; however, operation of the system will not be as efficient or reliable. Further, there would be a greater potential for inadequate chlorine contact time.

5.0 Updated Water System CIP Plan

Table 2 presents a proposed updated Water System CIP Plan.

Of concern, but not included in this plan is providing a more reliable power service line to the Carstens Reservoir Site.

This is the same CIP plan as the adopted 2009 Water System Master Plan with the following changes:

1. The option 1B Well No. 2 Backup Supply, was selected and Option 1A-Well No. 2-Additional Water Source was deleted due to the hydrogeologic limitation of both wells not being able to operate at the same time; however, the original budget for item 1B of $540,000 was replaced with the budget of $670,000 from Item 1A.

2. Item 3.1-Clearwell Flow Control valves discussed above were added under Item 3-SSFP Site Upgrades.

3. Item 3.2-SSF Filter Capacity Study and Transmission Line Controls discussed above was added under Item 3-SSFP Site Upgrades.

4. Item 3.3-SSF Inflow Control was added under Item 3-SSFP Site Upgrades.

5. Item 10 - Initial Leak Detection Survey was completed; however, this item was retained in the CIP plan as leak detection surveys should be done on a recurring basis (approximately every five years).

Table 2: Water System Capital Improvement Plan

Project	Description	Total Project Cost	Schedule	SDC Eligible Cost
1	Well No. 2 – Backup Supply	$670,000	Currently In Design	$670,000
2	Transmission Pipeline Replacement	$2,750,000	Pending 11B Below	$530,000
3	SSF Site Upgrades, Creation of Intermediate Pressure Zone	$270,000	Currently in Design	$0
3.1	Clearwell Flow and Level Control	$25,400	2011	$0
3.2	SSF Filter Capacity Study and Additional Transmission Line Controls	$6,000	2012, Pending SSF testing	$0
3.3	SSF Inlet Control	$4,500	Optional	$0
4	Behrman Well Site Upgrades*	$220,000	Currently in Design	$0
5	1.0-MG Main Zone Reservoir	$2,200,000	By 2024	$2,200,000
6	Distribution System Looping and Upgrades	$620,000	2010-2024	$0
7	SCADA System Upgrades	$450,000	optional	$0

8	Automatic Meter Reading	$420,000	optional	$0
9	Security System Upgrades	$100,000	optional	$0
10	Leak Detection Survey	$10,000	2015	$0
11A	Quail Valley Golf Course Study	$40,000	2010	$40,000
	Design & Construction	$1,200,000	2011	$1,200,000
11B	Sellers Road Wellfield Study	$150,000	2011	$150,000
	Design & Construction	$2,400,000	2012	$2,400,000
11C	Southwest Well Field Study	$300,000	2013	$300,000
	Design & construction	$1,500,000	2014	$1,500,000
11D	Alternative Water Providers	$0	2010	$0
	CIP Total:	**$13,340,000***		**$8,860,000**

*Rounded to the nearest $10,000

Exhibit F: City of Banks Updated Water System Capital Improvement Plan

Kennedy/Jenks Consultants

5 September 2014

Memorandum

To: Jolynn Becker – City of Banks

From: Rob Peacock – Kennedy/Jenks Consultants

Subject: Updated Water System Capital Improvement Plan 2014 (Revised 9/5/14)
K/J 0791015*00

An updated Water System Capital Improvement Plan (CIP) is presented below. We added a Source Water Protection Plan for the springs and well field, a Water Master Plan Update, and a Water Management and Conservation Plan Update. The list has been arranged in chronological order, and the timing of the projects has been coordinated with the draft CIP provided in the rate study currently in development by Shaun Piggot & Associates. Projects 1, 3, 3.1, 3.2, and 4 from the 2011 CIP Update (attached) have been completed.

Water System Capital Improvement Plan

CIP Project	Description	Project Cost	Schedule[b]	SDC-Eligible Cost
	Water Conservation Management Plan Update	$ 30,000	2014-2015	$ 0
6	Distribution System Looping and Upgrades	$ 620,000	2016-2026	$ 0
	Source Water Protection Plan	$ 50,000	2016-2017	$ 0
11D	Investigate Alternative Water Providers	$ 0	2016	$ 0
11A	Quail Valley Golf Course Study[a]	$ 70,000	2016	$ 70,000
	Design & Construction	$ 1,200,000	2017	$ 1,200,000
11B	Sellers Road Well Field Study[a]	$ 150,000	2017	$ 150,000
	Design & Construction	$ 2,400,000	2018	$ 2,400,000
2	Transmission Pipeline Replacement	$ 2,750,000	2018-2020	$ 530,000
11C	Southwest Well Field Study[a]	$ 300,000	2018	$ 300,000
	Design & construction	$ 1,500,000	2019	$ 1,500,000
	Paint Carsten Reservoirs	$ 630,000	2019	$ 0
	Banks Road Line Replacement[d]	$ 400,000	2021	$ 0
	Cedar Canyon Line Replacement[d]	$ 300,000	2022	$ 0
5	1.0-MG Main Zone Reservoir	$ 2,200,000	2022 (By 2024)	$ 2,200,000
10	Leak Detection Survey[c]	$ 30,000	Every 3 years	$ 0
	Water Master Plan Update	$ 50,000	2025	$ 0
8	Automatic Meter Reading	$ 420,000	optional	$ 0
	Security System Upgrades	$ 100,000	optional	$ 0
3.3	SSF Inlet Control	$ 4,500	optional	$ 0
	CIP Total	**$13,300,000**		**$8,400,000**

(a) One source development project will be needed to accommodate growth within the planning window, it is unlikely the second will be needed. Projects completed for development will likely be shared with developers.
(b) Project schedule is based on current anticipated need, however, changes to this schedule should be based on actual need such as growth or asset condition.
(c) Leak Detection Survey cost is approximately $5,000 per survey and scheduled every 3 years.
(d) Replacement of 2" water line with 8" with no expansion beyond current service area.

Banks Road and Cedar Canyon water line replacements have been added to the CIP because the pipes are under-sized and don't meet City design standards. The proposed replacements would increase line size, but would not extend beyond current service areas. Extensions of these lines to serve new development would be driven by development, and would be funded by developers. The estimated costs for extensions are summarized below.

Water Line Extension Projects

Description	Estimated Project Cost	Schedule
Banks Road Line Extension	$ 500,000	Development-Driven
Cedar Canyon Line Extension	$ 1,300,000	Development-Driven
Total	**$1,800,000**	

Water Rights and Supply Status

The status of the City's water rights and water supply are summarized in the following table.

Water Source	Authorized Amount (cfs)[a]	Average Diversion 2014[b] (cfs)	Unused Authorized Amount (cfs)
Behrman Well #1	0.67	0.02	0.65
Behrman Well #2	1.0	0.27	0.73
Large Spring	0.42	0.26	0.16
Small Spring	0.18	0.02	0.16
Total	**2.27**	**0.56**	**1.71**

(a) cfs = cubic feet per second, 1 cfs = 449 gallons per minute
(b) September 2013 through August 2014

The actual capacity of these sources varies throughout the year. During hot weather in August 2014 the City implemented a curtailment program for 8 days because demand exceeded available supply. While many factors enter into demand and supply, the need to curtail water use in August 2014 indicates the demand is approaching the system's current water production capacity.

ATTACHMENT - 2011 CIP

Kennedy/Jenks Consultants

Memorandum

Jim Hough – City of Banks
27 July 2011
0791015.12

Table 2: Water System Capital Improvement Plan

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1	Well No. 2 – Backup Supply COMPLETE	$670,000	Currently In Design	$670,000
2	Transmission Pipeline Replacement	$2,750,000	Pending 11B Below	$530,000
3	SSF Site Upgrades, Creation of Intermediate Pressure Zone COMPLETE	$270,000	Currently in Design	$0
3.1	Clearwell Flow and Level Control COMPLETE	$25,400	2011	$0
3.2	SSF Filter Capacity Study and Additional Transmission Line Controls COMPLETE	$6,000	2012, Pending SSF testing	$0
3.3	SSF Inlet Control	$4,500	Optional	$0
4	Behrman Well Site Upgrades COMPLETE	$220,000	Currently in Design	$0
5	1.0-MG Main Zone Reservoir	$2,200,000	By 2024	$2,200,000
6	Distribution System Looping and Upgrades	$620,000	2010-2024	$0
7	SCADA System Upgrades	$450,000	optional	$0
8	Automatic Meter Reading	$420,000	optional	$0
9	Security System Upgrades	$100,000	optional	$0
10	Leak Detection Survey	$10,000	2015	$0
11A	Quail Valley Golf Course Study	$40,000	2010	$40,000
	Design & Construction	$1,200,000	2011	$1,200,000
11B	Sellers Road Wellfield Study	$150,000	2011	$150,000
	Design & Construction	$2,400,000	2012	$2,400,000
11C	Southwest Well Field Study	$300,000	2013	$300,000
	Design & construction	$1,500,000	2014	$1,500,000
11D	Alternative Water Providers	$0	2010	$0
	CIP Total:	**$13,340,000***		**$8,860,000**

*Rounded to the nearest $10,000

Exhibit G: City of Banks Water Conservation Program Expenditures 2009-2017

City of Banks' Water Conservation Program Expenditures

Contractor	2009-2010	2010-2011	2011-2012	2012-2013	2013-2014	2014-2015	2015-2016	2016-2017	2017-2018
Lyda Excavating	$ 250.00	$ 16,721.00	$ -	$ -	$ -	$ 1,531.00	$ -	$ -	$ -
Frost Enineering	$ -	$ 23,923.00	$ -	$ -	$ -	$ 2,020.00	$ -	$ -	$ -
A&A Drilling Service, Inc	$ -	$ -	$ -	$ -	$ -	$ 1,740.00	$ 6,700.00	$ -	$ -
Utility Services	$ -	$ -	$ -	$ -	$ -	$ 4,128.00	$ -	$ -	$ -
Knife River	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ 14,400.00	$ -
2KG Contractors	$ -	$ -	$ 22,950.00	$ -	$ -	$ -	$ -	$ -	$ -
Five Star Builder	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ 12,013.00	$ -
M& T Excavating	$ 1,645.00	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -
Education Outreach	$ 427.32	$ 761.37	$ 797.59	$ 503.00	$ 425.00	$ 299.00	$ 299.00	$ -	$ -
American Leak Detection	$ -	$ -	$ -	$ -	$ 3,750.00	$ -	$ 650.00	$ -	$ 4,500.00
Liquivision Technoloty, Inc	$ -	$ -	$ -	$ -	$ -	$ -	$ 2,735.00	$ -	$ -
Kennedy Jenks Consultants	$ 4,385.21	$ -	$ -	$ -	$ -	$ 14,567.00	$ 7,146.00	$ -	$ -
	$ 6,707.53	$ 41,405.37	$ 23,747.59	$ 503.00	$ 4,175.00	$ 24,285.00	$ 17,530.00	$ 26,413.00	$ 4,500.00

Work that was completed

Repair Fire Hydrant
Meters
Quail Hollow Appartment
Banks Lumber Co
Banks Fire Co
Add Metering Zones to ID Water Leaks
Repair Water Leaks
Fixed Leak in the Water Tank
Leak Detection
Master Plan Update
Replacing the sand
SCADA Updates
New Turbidmeters

Exhibit H: WASH 7651 Annual Water Usage Reports

Water Year	Report ID	Facility Name	October	November	December	January	February	March	April	May	June	July	August	September	Total Water Used	Irrigated Acres	Method of Measurement	Water Right Holder's Name	Company Name
2016	11175	WELL 1 (WASH 7651)	0.75495	1.71858	0.94522	0.65368	0.00307	0	0.2762	0.63833	0.66288	1.44852	1.26439	3.31441	11.68023		Flowmeter (recording monthly readings and then reporting the difference between one month's reading and the next)	THOMAS TUSKI	CITY OF BANKS PW DEPT
2015	11175	WELL 1 (WASH 7651)	2.48274	1.90272	2.14516	2.2004	2.18199	1.70938	0.57388	1.18459	2.1605	0	0	0	16.54136		Flowmeter (recording monthly readings and then reporting the difference between one month's reading and the next)	THOMAS TUSKI	CITY OF BANKS PW DEPT
2014	11175	WELL 1 (WASH 7651)	2.0399	0.2225	0.20869	1.35539	1.16986	0.71198	0.63833	1.04711	1.14777	2.49808	0.89919	1.86159	13.80039		Flowmeter (recording monthly readings and then reporting the difference between one month's reading and the next)	THOMAS TUSKI	CITY OF BANKS PW DEPT
2013	11175	WELL 1 (WASH 7651)	0.10741	0.01166	1.08946	0.06414	0.56468	0.06752	0	0.00921	1.89044	1.78303	1.11708	0.86236	7.56699			THOMAS TUSKI	CITY OF BANKS PW DEPT
2012	11175	WELL 1 (WASH 7651)	13.05631	12.43762	13.4789	17.38008	13.87448	16.5861	16.356	21.7017	21.95335	22.48765	0.82185	0.26086	170.39489			THOMAS TUSKI	CITY OF BANKS PW DEPT
2011	11175	WELL 1 (WASH 7651)	5.97821	5.71122	2.34157	2.75863	4.22526	5.72319	7.26623	7.12721	13.58938	20.02762	23.97668	20.10711	118.83231			THOMAS TUSKI	CITY OF BANKS PW DEPT
2010	11175	WELL 1 (WASH 7651)	7.31134	5.32239	6.26362	4.67577	2.80037	2.29032	3.22633	3.55716	6.089	17.50652	16.2897	10.36919	85.70171			THOMAS TUSKI	CITY OF BANKS PW DEPT
2009	11175	WELL 1 (WASH 7651)	6.49348	5.74191	7.21283	7.94323	3.6348	2.78932	3.69557	7.77965	16.61163	20.72948	16.82799	12.48059	111.94048			THOMAS TUSKI	CITY OF BANKS PW DEPT
2008	11175	WELL 1 (WASH 7651)	4.01289	4.25012	5.14685	3.16587	2.96302	1.66396	1.95642	6.75526	12.62667	19.66303	17.18459	14.60488	93.99356			THOMAS TUSKI	CITY OF BANKS PW DEPT
2007	11175	WELL 1 (WASH 7651)	7.63634	4.39712	2.74329	6.6902	2.71935	4.24336	0.54473	4.05309	10.36458	16.2139	19.25119	12.56038	91.41753			THOMAS TUSKI	CITY OF BANKS PW DEPT
2006	11175	WELL 1 (WASH 7651)	6.28295	5.648	5.88553	4.61869	4.2271	5.29109	0.40141	10.48	13.84717	21.7327	18.38852	10.79853	107.60167			THOMAS TUSKI	CITY OF BANKS PW DEPT

2005	11175	WELL 1 (WASH 7651)				4.69388	3.54151	4.70677	3.34019	5.32607	6.16327	53.06123	25.77014	15.33006	121.93312			THOMAS TUSKI	CITY OF BANKS PW DEPT
2004	11175	WELL 1 (WASH 7651)	5.13273	2.00491	2.36643	1.5903	1.7861	2.28326	0.75679	4.61409	11.04465	22.46064	16.29062	8.8461	79.17662			THOMAS TUSKI	CITY OF BANKS PW DEPT
2003	11175	WELL 1 (WASH 7651)	9.59214	4.9848	5.81402	4.52201	0.87923	0.35108	2.60242	0.52478	12.63065	22.03651	17.67807	16.70461	98.32032			THOMAS TUSKI	CITY OF BANKS PW DEPT
2002	11175	WELL 1 (WASH 7651)	14.08807	6.5616	4.14485	0	0	0	0	1.16556	10.25686	15.75448	20.8286	14.76507	87.56509			THOMAS TUSKI	CITY OF BANKS PW DEPT
2001	11175	WELL 1 (WASH 7651)	13.43747	14.93754	5.62375	3.56053	9.95304	5.88123	6.50421	11.601	15.73116	20.66748	21.15912	17.23829	146.29486			THOMAS TUSKI	CITY OF BANKS PW DEPT
1998	11175	WELL 1 (WASH 7651)	0	0	0	0	0	0	0	0	8.15427	153.859	233.6286	161.62654	557.26845			THOMAS TUSKI	CITY OF BANKS PW DEPT
1997	11175	WELL 1 (WASH 7651)	0	0	0	0	0	0	0	0.78714	0.7402	10.00271	11.69261	2.12137	25.34403			THOMAS TUSKI	CITY OF BANKS PW DEPT
1996	11175	WELL 1 (WASH 7651)	7.75748	8.6764	8.30411	7.89775	14.57573	8.8082	8.32222	7.79128	9.8722	17.16653	16.86855	11.09584	127.13629			THOMAS TUSKI	CITY OF BANKS PW DEPT
1994	11175	WELL 1 (WASH 7651)	7.14663	4.884	4.74502	7.60636	6.66788	4.78175	3.98072	6.09396	4.48698	14.32199	9.12	6.96694	80.80223			THOMAS TUSKI	CITY OF BANKS PW DEPT
1993	11175	WELL 1 (WASH 7651)	7.00275	4.74534	7.37741	7.50843	3.98836	0.69323	3.20631	3.68349	3.55342	3.92225	8.207	7.94226	61.83025			THOMAS TUSKI	CITY OF BANKS PW DEPT
1992	11175	WELL 1 (WASH 7651)	3.67156	3.73951	5.06306	2.25223	4.37803	1.81237	2.57697	5.03276	7.64217	9.50689	8.1399	4.16713	57.98258			THOMAS TUSKI	CITY OF BANKS PW DEPT
1991	11175	WELL 1 (WASH 7651)	4.22498	3.00886	4.52128	3.13896	2.307	2.02204	1.74718	2.21058	2.34527	8.07989	9.54483	5.09855	48.24942			THOMAS TUSKI	CITY OF BANKS PW DEPT
1990	11175	WELL 1 (WASH 7651)	1.25689	7.71396	4.86364	4.83632	1.1421	3.81703	1.27916	1.50413	2.93044	6.45776	7.26538	5.58058	48.64739			THOMAS TUSKI	CITY OF BANKS PW DEPT
1988	11175	WELL 1 (WASH 7651)	0	0	0	9.66702	9.66702	9.66702	9.66702	9.66702	9.66702	9.66702	9.66702	9.66702	87.00318			THOMAS TUSKI	CITY OF BANKS PW DEPT

Water Use Report Based on Water Right

excel
text

Permit: G 7593 *

CITY OF BANKS CITY HALL 150 NE BANKS RD BANKS, OR 97106

Records per page: 10

Acre-feet (AF) of Water Used

Water Year*	Report ID	Facility	Oct	Nov	Dec	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Total Water Used	Irrigated Acres
2016	11175	WELL 1 (WASH 7651)	0.75	1.72	0.95	0.65	0.00	0.00	0.28	0.64	0.66	1.45	1.26	3.31	11.68	
2015	11175	WELL 1 (WASH 7651)	2.48	1.90	2.15	2.20	2.18	1.71	0.57	1.18	2.16	0.00	0.00	0.00	16.54	
2014	11175	WELL 1 (WASH 7651)	2.04	0.22	0.21	1.36	1.17	0.71	0.64	1.05	1.15	2.50	0.90	1.86	13.80	
2013	11175	WELL 1 (WASH 7651)	0.11	0.01	1.09	0.06	0.56	0.07	0.00	0.01	1.89	1.78	1.12	0.86	7.57	
2012	11175	WELL 1 (WASH 7651)	13.06	12.44	13.48	17.38	13.87	16.59	16.36	21.70	21.95	22.49	0.82	0.26	170.39	
2011	11175	WELL 1 (WASH 7651)	5.98	5.71	2.34	2.76	4.23	5.72	7.27	7.13	13.59	20.03	23.98	20.11	118.83	
2010	11175	WELL 1 (WASH 7651)	7.31	5.32	6.26	4.68	2.80	2.29	3.23	3.56	6.09	17.51	16.29	10.37	85.70	
2009	11175	WELL 1 (WASH 7651)	6.49	5.74	7.21	7.94	3.63	2.79	3.70	7.78	16.61	20.73	16.83	12.48	111.94	
2008	11175	WELL 1 (WASH 7651)	4.01	4.25	5.15	3.17	2.96	1.66	1.96	6.76	12.63	19.66	17.18	14.60	93.99	
2007	11175	WELL 1 (WASH 7651)	7.64	4.40	2.74	6.69	2.72	4.24	0.54	4.05	10.36	16.21	19.25	12.56	91.42	

1 2 3

*The water year is named for the calendar year in which it ends. Example: the 2014 water year begins Oct. 1, 2013 and ends Sep. 30, 2014.

- Water use is reported by point of diversion (POD), rather than by water right.
- If a POD is shared with multiple water rights, it is not feasible to separate out the amount used under the water right being queried from water used by other rights using this same POD.
- Monthly amounts indicate:
  - For diverted rights, the total amount diverted during the month;
  - For storage rights, the amount generally stored in the reservoir/pond during the month, as represented by the volume of water impounded on approximately the same day each month.
- Water Use amounts have all been converted to "acre-feet" (AF), regardless of the original measurement unit reported. One AF is the volume of water that will cover an acre of ground one foot deep = 325,850 gallons.
- Zeroes indicate that a report was received, stating that no water was used during those months; if a year is not listed, no report of water use was received for that year.

Water Use Report Based on Water Right

excel
text

Permit: G 7593 *

CITY OF BANKS CITY HALL 150 NE BANKS RD BANKS, OR 97106

Records per page: 10

Acre-feet (AF) of Water Used

Water Year*	Report ID	Facility	Oct	Nov	Dec	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Total Water Used	Irrigated Acres
2006	11175	WELL 1 (WASH 7651)	6.28	5.65	5.89	4.62	4.23	5.29	0.40	10.48	13.85	21.73	18.39	10.80	107.60	
2005	11175	WELL 1 (WASH 7651)				4.69	3.54	4.71	3.34	5.33	6.16	53.06	25.77	15.33	121.93	
2004	11175	WELL 1 (WASH 7651)	5.13	2.00	2.37	1.59	1.79	2.28	0.76	4.61	11.04	22.46	16.29	8.85	79.18	
2003	11175	WELL 1 (WASH 7651)	9.59	4.98	5.81	4.52	0.88	0.35	2.60	0.52	12.63	22.04	17.68	16.70	98.32	
2002	11175	WELL 1 (WASH 7651)	14.09	6.56	4.14	0.00	0.00	0.00	0.00	1.17	10.26	15.75	20.83	14.77	87.57	
2001	11175	WELL 1 (WASH 7651)	13.44	14.94	5.62	3.56	9.95	5.88	6.50	11.60	15.73	20.67	21.16	17.24	146.29	
1998	11175	WELL 1 (WASH 7651)	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	8.15	153.86	233.63	161.63	557.27	
1997	11175	WELL 1 (WASH 7651)	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.79	0.74	10.00	11.69	2.12	25.34	
1996	11175	WELL 1 (WASH 7651)	7.76	8.68	8.30	7.90	14.58	8.81	8.32	7.79	9.87	17.17	16.87	11.10	127.14	
1994	11175	WELL 1 (WASH 7651)	7.15	4.88	4.75	7.61	6.67	4.78	3.98	6.09	4.49	14.32	9.12	6.97	80.80	

1 2 3

*The water year is named for the calendar year in which it ends. Example: the 2014 water year begins Oct. 1, 2013 and ends Sep. 30, 2014.

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CITY OF BANKS CITY HALL 150 NE BANKS RD BANKS, OR 97106

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Water Year*	Report ID	Facility	Acre-feet (AF) of Water Used												Total Water Used	Irrigated Acres
			Oct	Nov	Dec	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep		
1993	11175	WELL 1 (WASH 7651)	7.00	4.75	7.38	7.51	3.99	0.69	3.21	3.68	3.55	3.92	8.21	7.94	61.83	
1992	11175	WELL 1 (WASH 7651)	3.67	3.74	5.06	2.25	4.38	1.81	2.58	5.03	7.64	9.51	8.14	4.17	57.98	
1991	11175	WELL 1 (WASH 7651)	4.22	3.01	4.52	3.14	2.31	2.02	1.75	2.21	2.35	8.08	9.54	5.10	48.25	
1990	11175	WELL 1 (WASH 7651)	1.26	7.71	4.86	4.84	1.14	3.82	1.28	1.50	2.93	6.46	7.27	5.58	48.65	
1988	11175	WELL 1 (WASH 7651)	0.00	0.00	0.00	9.67	9.67	9.67	9.67	9.67	9.67	9.67	9.67	9.67	87.00	

1 2 3

*The water year is named for the calendar year in which it ends. Example: the 2014 water year begins Oct. 1, 2013 and ends Sep. 30, 2014.

- Water use is reported by point of diversion (POD), rather than by water right.
- If a POD is shared with multiple water rights, it is not feasible to separate out the amount used under the water right being queried from water used by other rights using this same POD.
- Monthly amounts indicate:
  - For diverted rights, the total amount diverted during the month;
  - For storage rights, the amount generally stored in the reservoir/pond during the month, as represented by the volume of water impounded on approximately the same day each month.
- Water Use amounts have all been converted to "acre-feet" (AF), regardless of the original measurement unit reported. One AF is the volume of water that will cover an acre of ground one foot deep = 325,850 gallons.
- Zeroes indicate that a report was received, stating that no water was used during those months; if a year is not listed, no report of water use was received for that year.

Exhibit I: Portland State University Population Research Center, *Coordinated Population Forecast 2017-2067 Washington County*

Coordinated Population Forecast

2017

Through

2067

Washington County

Urban Growth
Boundaries (UGB)
& Area Outside UGBs

Population Research Center
PORTLAND STATE UNIVERSITY

Photo Credit: A barn in the Helvetia area. (Photo No. washDA0020). Gary Halvorson, Oregon State Archives http://arcweb.sos.state.or.us/pages/records/local/county/scenic/Washington/16.html

Coordinated Population Forecast for Washington County, its Urban Growth Boundaries (UGB), and Area Outside UGBs 2017-2067

Prepared by

Population Research Center

College of Urban and Public Affairs

Portland State University

June 30, 2017

This project is funded by the State of Oregon through the Department of Land Conservation and Development (DLCD). The contents of this document do not necessarily reflect the views or policies of the State of Oregon.

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The Population Research Center and project staff wish to acknowledge and express gratitude for support from the Forecast Advisory Committee (DLCD), the hard work of our staff Deborah Loftus and Emily Renfrow, data reviewers, and many people who contributed to the development of these forecasts by answering questions, lending insight, providing data, or giving feedback.

How to Read this Report

This report should be read with reference to the documents listed below—downloadable on the Forecast Program website (http://www.pdx.edu/prc/opfp).

Specifically, the reader should refer to the following documents:

- *Methods and Data for Developing Coordinated Population Forecasts*—Provides a detailed description and discussion of the forecast methods employed. This document also describes the assumptions that feed into these methods and determine the forecast output.
- *Forecast Tables*—Provides complete tables of population forecast numbers by county and all sub-areas within each county for each five-year interval of the forecast period (i.e., 2017-2067).

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Table of Figures

Executive Summary

Historical

Different parts of the county experience differing growth patterns. Local trends within the UGBs and the area outside them collectively influence population growth rates for the county as a whole.

Washington County's total population has grown strongly during the 2000s, with an average annual growth rate of 1.8 percent between 2000 and 2010. However, some of its sub-areas experienced more rapid population growth during the 2000s. North Plains, the most populous UGB in Washington County outside of the Metro boundary, and Banks, posted the highest average annual growth rates at 2.0 and 3.0 percent, respectively, during the 2000 to 2010 period.

Washington County's population growth during the 2000s was largely the result of natural increase. However, an aging population not only led to an increase in deaths but also resulted in a smaller proportion of women in their childbearing years. This, along with more women choosing to have fewer children and have them at older ages has led to fewer births in recent years. The larger number of births relative to deaths caused a natural increase (more births than deaths) in every year from 2000 to 2015. While natural increase outweighed net in-migration for the majority of the 2000s (except for 2006 and 2007); net in-migration has risen in recent years (2013 to 2015), outpacing natural increase in both 2014 and 2015 (Figure 12).

Forecast

Total population in Washington County and its sub-areas outside of the county's Metro boundary will likely grow at a faster pace in the near-term (2017 to 2035) compared to the long-term. North Plains, with the second strongest population growth in the 2000s after Banks, is expected to experience faster rates of population growth, while Banks is expected to experience a slower growth during the forecast period. The Washington County portion of Gaston experienced slower growth rates it is expected to maintain (Figure 1). The tapering of growth rates is largely driven by an aging population—a demographic trend which is expected to contribute to a diminishing natural increase (more births than deaths). As natural increase lessens population growth will become increasingly reliant on net in-migration.

Even so, Washington County's total population is forecast to increase by close to 176,000 over the next 18 years (2017-2035) and by more than 269,000 over the second part of the forecast period (2035-2067). North Plains, with the second strongest population growth in the 2000s after Banks, is expected to experience faster rates of population growth, while Banks is expected to experience slower growth during the forecast period. The Washington County portion of Gaston experienced slower growth rates it is expected to maintain.

Figure 1. Washington County and Sub-Areas—Historical and Forecast Populations, and Average Annual Growth Rates (AAGR)

	Historical			Forecast				
	2000	2010	AAGR (2000-2010)	2017	2035	2067	AAGR (2017-2035)	AAGR (2035-2067)
Washington County	*445,342*	*529,710*	*1.8%*	*589,562*	*765,445*	*1,035,089*	*1.5%*	*0.9%*
Banks UGB	1,395	1,876	3.0%	1,908	2,887	3,388	2.3%	0.5%
Gaston UGB (Washington)	624	646	0.3%	654	691	726	0.3%	0.2%
North Plains UGB	1,605	1,964	2.0%	2,266	5,922	7,718	5.5%	0.8%
Outside UGBs	25,553	25,429	0.0%	25,566	23,724	23,233	-0.4%	-0.1%

Sources: U.S. Census Bureau, 2000 and 2010 Censuses; Forecast by Population Research Center (PRC).

Note: PRC does not forecast populations within the Metro area. As a result, population numbers do not add up in this table.

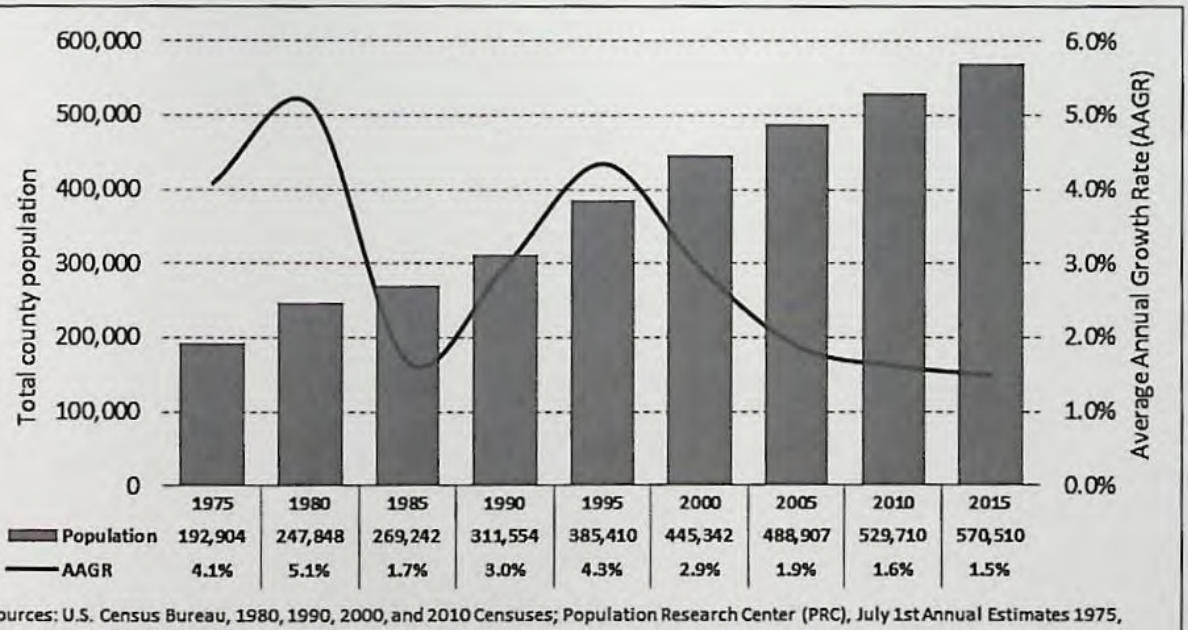
Historical Trends

Different growth patterns occur in different parts of the County. Each of Washington County's sub-areas was examined for any significant demographic characteristics or changes in population or housing growth that might influence their individual forecasts. Factors that were analyzed include age composition of the population, ethnicity and race, births, deaths, migration, and number of housing units as well as the occupancy rate and persons per household (PPH). It should be noted that population trends of individual sub-areas often differ from those of the county as a whole. However, population growth rates for the county are collectively influenced by local trends within its sub-areas.

Population

Washington County's total population grew from roughly 192,900 in 1975 to 570,510 in 2015 (**Figure 2**). During this 40-year period, the county realized the highest growth rates during the late 1970s, which coincided with a period of relative economic prosperity. During the early 1980s, challenging economic conditions, both nationally and within the county, led to slower population growth. During the early 1990s population growth rates again increased, but challenging economic conditions in the late 1990s again yielded growth to slow. Still, Washington County experienced rapid population growth between 2000 and 2015—averaging about 1.6 percent per year.

Figure 2. Washington County—Total Population by Five-year Intervals (1975 – 2010 and 2010-2015)



	1975	1980	1985	1990	1995	2000	2005	2010	2015
Population	192,904	247,848	269,242	311,554	385,410	445,342	488,907	529,710	570,510
AAGR	4.1%	5.1%	1.7%	3.0%	4.3%	2.9%	1.9%	1.6%	1.5%

Sources: U.S. Census Bureau, 1980, 1990, 2000, and 2010 Censuses; Population Research Center (PRC), July 1st Annual Estimates 1975, 1985, 1995, 2005, and 2015.

During the 2000s, Washington County's average annual population growth rate stood just below two percent (**Figure 3**). At the same time, Banks and North Plains recorded faster average annual growth rates of 3.0 and 2.0 percent, respectively. The Washington portion of Gaston, however, experienced an average annual growth rate less than half a percent. The area outside UGBs recorded a slight population decline between 2000 and 2010.

Figure 3. Washington County and Sub-areas—Total Population and Average Annual Growth Rate (AAGR) (2000 and 2010)[1]

	2000	2010	AAGR (2000-2010)	Share of County 2000	Share of County 2010
Washington County	*445,342*	*529,710*	*1.8%*	*100.0%*	*100.0%*
Banks UGB	1,395	1,876	3.0%	0.3%	0.4%
Gaston UGB (Washington)	624	646	0.3%	0.1%	0.1%
North Plains UGB	1,605	1,964	2.0%	0.4%	0.4%
Outside UGBs	25,553	25,429	0.0%	5.7%	4.8%

Sources: U.S. Census Bureau, 2000 and 2010 Censuses.

Note: PRC does not forecast populations within the Metro area. As a result, population numbers and shares do not add up in this table.

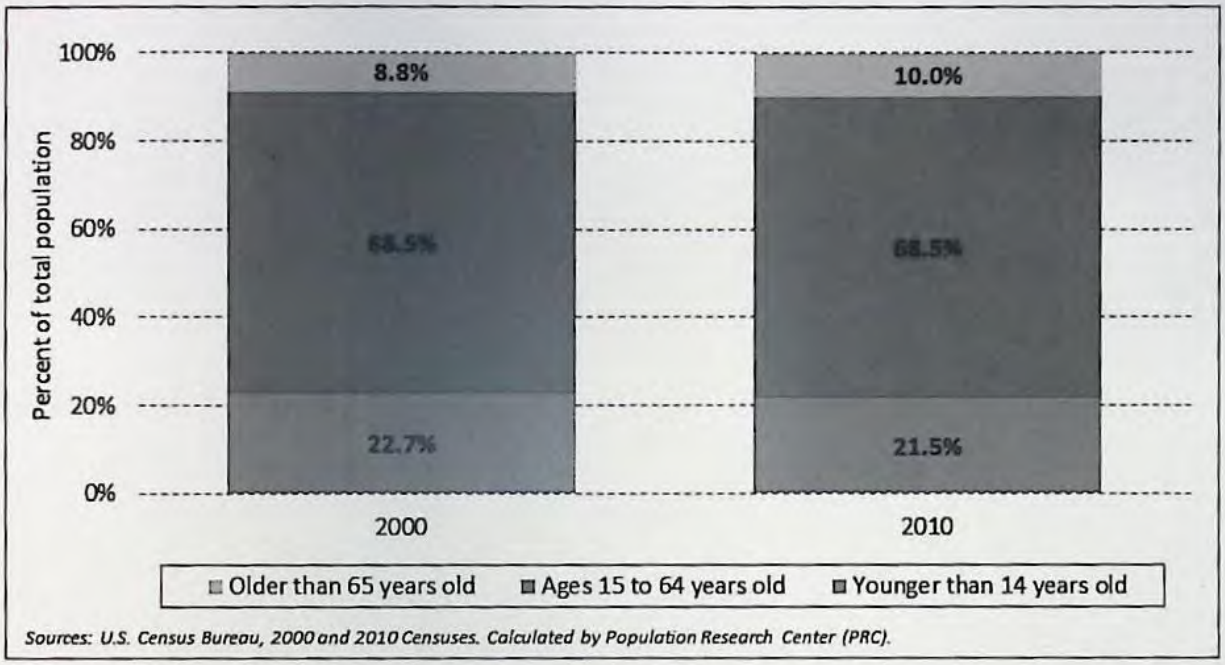
Age Structure of the Population

Washington County's population is aging at a faster pace compared to most Oregon counties. An aging population typically increases the number of deaths but also yields a smaller proportion of women in their childbearing years, which may result in a decline in births. However, for Washington County this has not been entirely true. Births increased with the county's population in spite of the rise in the proportion of county population 65 or older between 2000 and 2010 (**Figure 4**). To further underscore Washington County's rapid trend in aging, the median age increased from about 33 in 2000 to 35.3 in 2010 and to 36.1 in 2015, an increase that is larger than observed statewide and several other counties in the region during the same time frame.[2]

[1] When considering growth rates and population growth overall, it should be noted that a slowing of growth rates does not necessarily correspond to a slowing of population growth in absolute numbers. For example, if a UGB with a population of 100 grows by another 100 people, it has doubled in population. If it then grows by another 100 people during the next year, its relative growth is half of what it was before even though absolute growth stays the same.

[2] Median age is sourced from the U.S. Census Bureau's 2000 and 2010 Censuses and 2011-2015 ACS 5-year Estimates.

Figure 4. Washington County—Age Structure of the Population (2000 and 2010)



Sources: U.S. Census Bureau, 2000 and 2010 Censuses. Calculated by Population Research Center (PRC).

Race and Ethnicity

While the statewide population is aging, another demographic shift is occurring across Oregon: minority populations are growing as a share of total population. A growing minority population affects both the number of births and average household size. The Hispanic share of the total population increased substantially from 2000 to 2010 (Figure 5), while the share for the White, non-Hispanic population decreased over the same time period. This growing proportion of the Hispanic population and other minority populations brings with it several implications for future population change. First, both nationally and at the state level, fertility rates among Hispanic and minority women tend to be higher than among white, non-Hispanic women. However, it is important to note recent trends show these rates are quickly decreasing. Second, Hispanic and minority households tend to be larger relative to white, non-Hispanic households.

Figure 5. Washington County—Hispanic or Latino and Race (2000 and 2010)

Hispanic or Latino and Race	2000		2010		Absolute Change	Relative Change
Total population	*445,342*	*100.0%*	*529,710*	*100.0%*	*84,368*	*18.9%*
Hispanic or Latino	49,735	11.2%	83,270	15.7%	33,535	67.4%
Not Hispanic or Latino	395,607	88.8%	446,440	84.3%	50,833	12.8%
White alone	346,251	77.7%	369,453	69.7%	23,202	6.7%
Black or African American alone	4,778	1.1%	8,861	1.7%	4,083	85.5%
American Indian and Alaska Native alone	2,335	0.5%	2,559	0.5%	224	9.6%
Asian alone	29,552	6.6%	45,354	8.6%	15,802	53.5%
Native Hawaiian and Other Pacific Islander alone	1,249	0.3%	2,269	0.4%	1,020	81.7%
Some Other Race alone	650	0.1%	940	0.2%	290	44.6%
Two or More Races	10,792	2.4%	17,004	3.2%	6,212	57.6%

Sources: U.S. Census Bureau, 2000 and 2010 Censuses.

Births

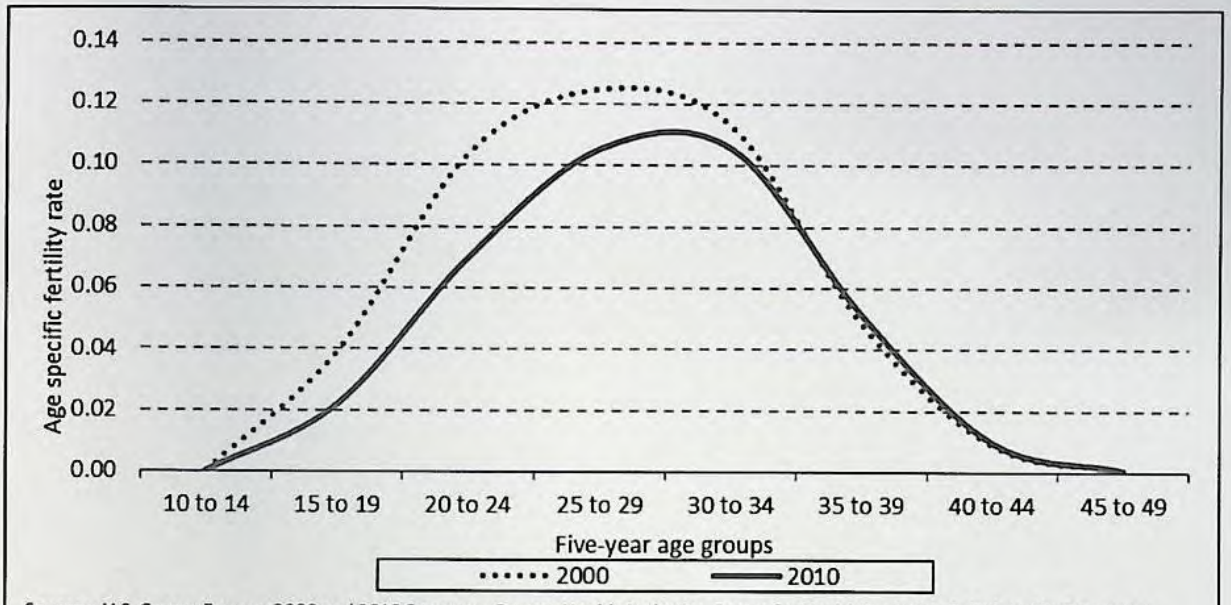
Historical fertility rates for Washington County mirror the decreasing trends of fertility rates in Oregon as a whole. Total fertility rates decreased notably in Washington County from 2000 to 2010 (Figure 6). At the same time, fertility for women over 30 years of age remained fairly stable for Washington County, while rates for women under 30 years of age declined (**Figure 7** and **Figure 8**). As **Figure 7** and Figure 8 demonstrate, total fertility in Washington County and Oregon was lower in 2010 compared to 2000 largely because women are having children at older ages. The direction of Washington County's fertility changes is comparable to that of the state as a whole, but the magnitude was greater for the county. In 2000, Washington County's TFR was above replacement fertility, while Oregon as a whole was below that level. Oregon continues to fall further below replacement fertility, and Washington County's larger decrease in TFR brought it in line with the 2010 state rate.

Figure 6. Washington County and Oregon—Total Fertility Rates (2000 and 2010)

	2000	2010
Washington County	2.20	1.81
Oregon	1.98	1.80

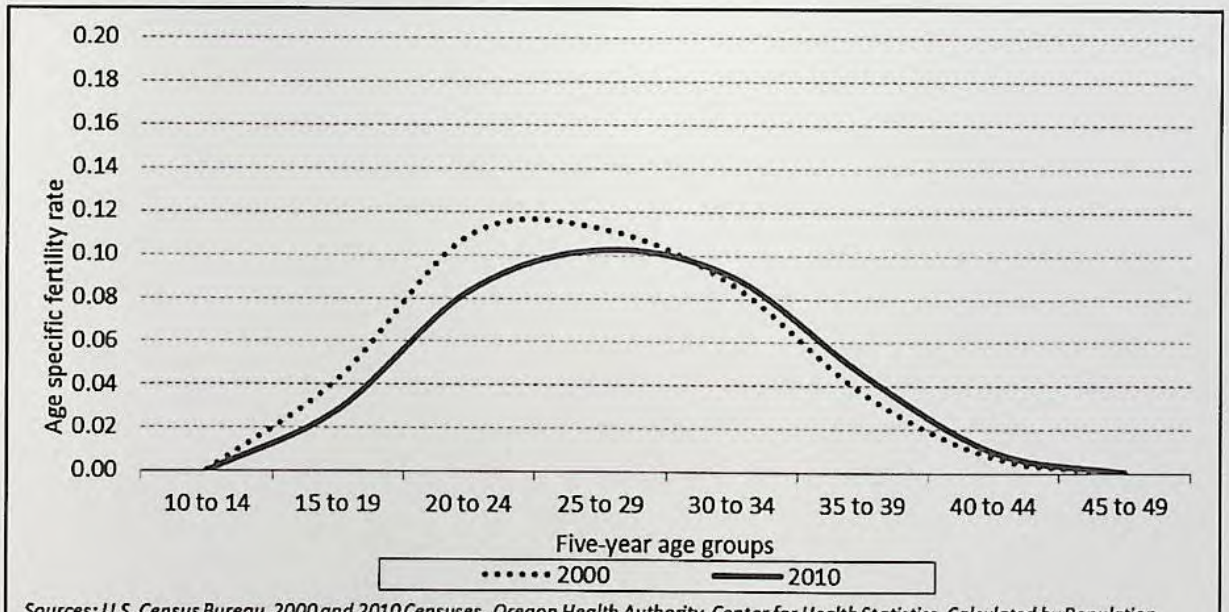
Sources: U.S. Census Bureau, 2000 and 2010 Censuses.
Oregon Health Authority, Center for Health Statistics.
Calculated by Population Research Center (PRC).

Figure 7. Washington County—Age Specific Fertility Rate (2000 and 2010)



Sources: U.S. Census Bureau, 2000 and 2010 Censuses. Oregon Health Authority, Center for Health Statistics. Calculated by Population Research Center (PRC).

Figure 8. Oregon—Age Specific Fertility Rate (2000 and 2010)



Sources: U.S. Census Bureau, 2000 and 2010 Censuses. Oregon Health Authority, Center for Health Statistics. Calculated by Population Research Center (PRC).

Figure 9 shows the number of births by the area in which the mother resides. Note that the number of births fluctuates from year to year. For example, a sub-area with an increase in births between two

years could easily show a decrease for a different time period. With the exception of the area outside UGBs, the county and its sub-areas recorded more births in 2010 than they had in 2000.

Figure 9. Washington County and Sub-Areas—Total Births (2000 and 2010)

	2000	2010	Absolute Change	Relative Change	Share of County 2000	Share of County 2010
Washington County	*7286*	*7389*	*103*	*1.4%*	*100.0%*	*100.0%*
Outside UGBs	226	188	-38	-16.8%	3.1%	2.5%
Smaller UGBs & Metro UGBs	7060	7201	141	2.0%	96.9%	97.5%

Sources: Oregon Health Authority, Center for Health Statistics. Aggregated by Population Research Center (PRC).

Note: Smaller UGBs are those with populations less than 7,000 in forecast launch year.

Deaths

Though Washington County's population is aging, life expectancy increased during the 2000s.[3] In 2000, life expectancy for males was 78 years and for females was 81 years. By 2010, life expectancy had increased for both males and females to 80 and 84 years, respectively. For both Washington County and Oregon, the survival rates changed little between 2000 and 2010—underscoring the fact that mortality is the most stable component of population change compared to births and migration. Even so, the total number of countywide deaths increased as the county's population grew (Figure 10).

Figure 10. Washington County and Sub-Areas—Total Deaths (2000 and 2010)

	2000	2010	Absolute Change	Relative Change	Share of County 2000	Share of County 2010
Washington County	*2448*	*2852*	*404*	*16.5%*	*100.0%*	*100.0%*
Outside UGBs	389	190	-199	-51.2%	15.9%	6.7%
Smaller UGBs & Metro UGBs	2059	2662	603	29.3%	84.1%	93.3%

Sources: Oregon Health Authority, Center for Health Statistics. Aggregated by Population Research Center (PRC).

Note 2: All other areas includes all smaller UGBs (those with populations less than 7,000) and the area outside UGBs. Detailed, point level death data were unavailable for 2000, thus PRC was unable to assign deaths to some UGBs.

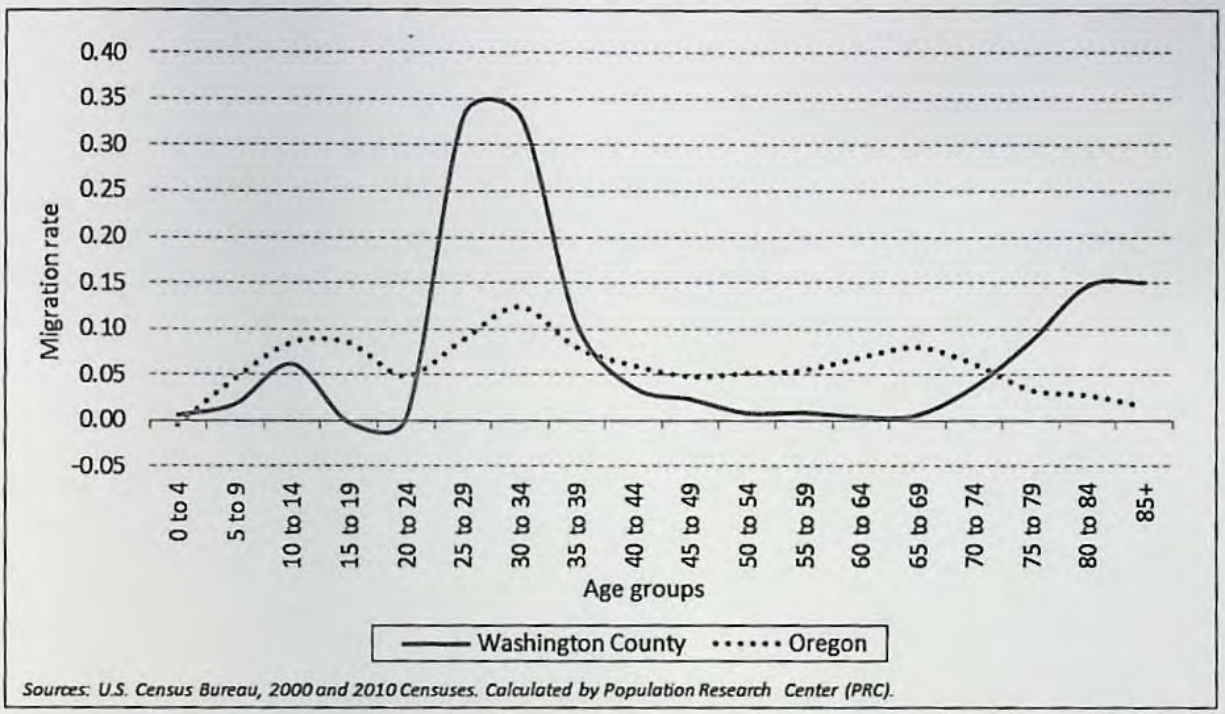
Migration

The propensity to migrate is strongly linked to age and stage of life. As such, age-specific migration rates are critically important for assessing these patterns across five-year age cohorts. **Figure 11** shows the historical age-specific migration rates by five-year age group, both for Washington County and Oregon. The migration rate is shown as the number of net in/out migrants per person by age group.

From 2000 to 2010, the county attracted a substantial number of adults, along with their children, and retirees in search of housing and employment opportunities. Other age groups saw minimal net change.

[3] Researchers have found evidence for a widening rural-urban gap in life expectancy. This gap is particularly apparent between race and income groups and may be one explanation for the decline in life expectancy in the 2000s. See the following research article for more information. *Singh, Gopal K., and Mohammad Siahpush. "Widening rural-urban disparities in life expectancy, US, 1969-2009." American Journal of Preventative Medicine 46, no. 2 (2014): e19-e29.*

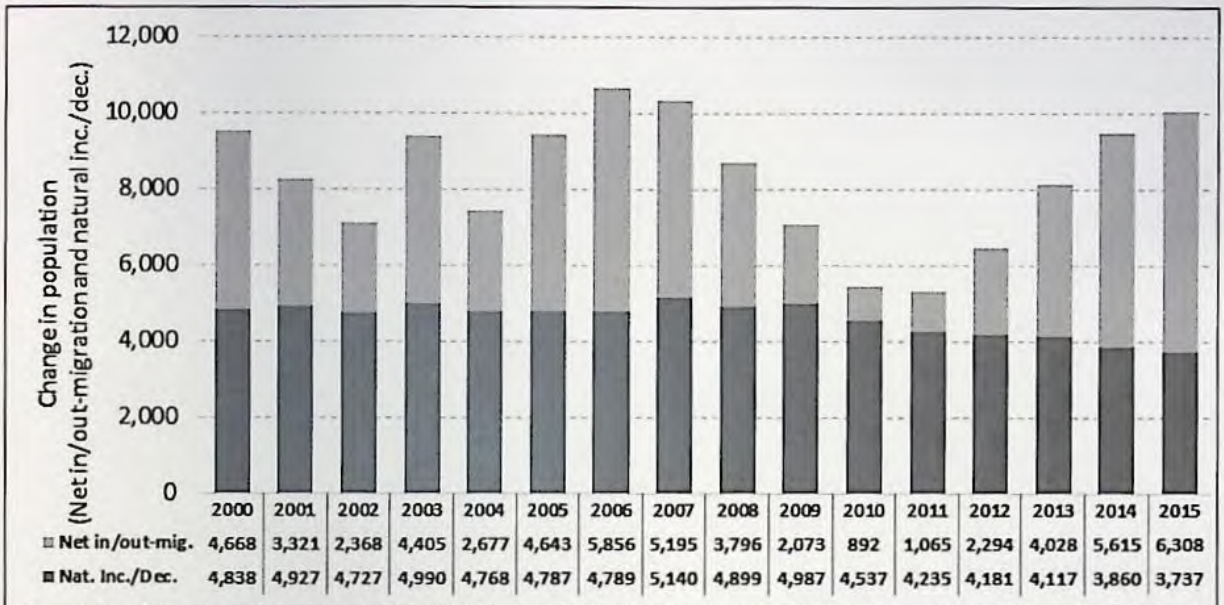
Figure 11. Washington County and Oregon—Age Specific Migration Rates (2000-2010)



Historical Trends in Components of Population Change

In summary, Washington County's positive population growth in the 2000s was the result of steady natural increase and periods of substantial net in-migration (**Figure 12**). The larger number of births relative to deaths has led to natural increase (more births than deaths) in every year from 2000 to 2015. While net in-migration fluctuated dramatically during the early years of the last decade and slowed in the years following the recession, the number of in-migrants has increased during recent years, contributing to population increase. Even so, historical trends show that natural increase accounted for the majority of the county's population change.

Figure 12. Washington County—Components of Population Change (2000-2014)



	2000	2001	2002	2003	2004	2005	2006	2007	2008	2009	2010	2011	2012	2013	2014	2015
Net in/out-mig.	4,668	3,321	2,368	4,405	2,677	4,643	5,856	5,195	3,796	2,073	892	1,065	2,294	4,028	5,615	6,308
Nat. Inc./Dec.	4,838	4,927	4,727	4,990	4,768	4,787	4,789	5,140	4,899	4,987	4,537	4,235	4,181	4,117	3,860	3,737

Sources: Population Research Center, July 1st Annual Estimates 2000-2015. Oregon Health Authority, Center for Health Statistics. Calculated by Population Research Center (PRC).

Housing and Households

The total number of housing units in Washington County increased rapidly during the middle years of this last decade (2000 to 2010), but this growth slowed with the onset of the Great Recession in 2008. Over the entire 2000 to 2010 period, the total number of housing units increased by about eighteen percent countywide; this was more than 33,500 new housing units (**Figure 13**). In terms of relative housing growth, all of Washington's sub-areas outside the Metro boundary grew at similar rates during the 2000s. The Washington portion of Gaston grew the fastest with a total housing unit increase of about 20 percent (42 housing units) by 2010.

The rates of increase in the number of total housing units in the county, UGBs, and area outside UGBs are similar to the growth rates of their corresponding populations. The growth rates for housing may slightly differ from the rates for population because the numbers of total housing units are smaller than the numbers of persons, or the UGB has experienced changes in the average number of persons per household or in occupancy rates. However, the pattern of population and housing change in the county is relatively similar.

Figure 13. Washington County and Sub-Areas—Total Housing Units (2000 and 2010)

	2000	2010	AAGR (2000-2010)	Share of County 2000	Share of County 2010
Washington County	*178,913*	*212,450*	*1.7%*	*100.0%*	*100.0%*
Banks	527	622	1.7%	0.3%	0.3%
Gaston (Washington)	211	253	1.8%	0.1%	0.1%
North Plains	634	753	1.7%	0.4%	0.4%
Outside UGBs	9,419	10,005	0.6%	5.3%	4.7%

Sources: U.S. Census Bureau, 2000 and 2010 Censuses.

Note: For simplicity each UGB is referred to by its primary city's name.

Note: PRC does not forecast populations within the Metro area. As a result, population numbers and shares do not add up in this table.

Occupancy rates tend to fluctuate more than PPH. This is particularly true in smaller UGB areas where fewer housing units allow for larger changes—in relative terms—in occupancy rates. From 2000 to 2010 the occupancy rate in Washington County remained stable. With the exception of Banks, which recorded a 5% increase in occupancy in 2010 relative to 2000, occupancy rates remained stable for the majority of areas.

Average household size, or persons per household (PPH), in Washington County was 2.6 in 2010, the same as in 2000 (**Figure 14**). Washington County's PPH in 2010 was slightly higher than for Oregon as a whole, which had a PPH of 2.5. PPH varied across the county's sub-areas, with each falling between 2.6 and 3.1 persons per household. In 2010, Banks had the highest PPH of 3.2 while the Washington portion of Gaston and the area outside UGBs, at 2.7, had the lowest.

Figure 14. Washington County and Sub-Areas—Persons per Household (PPH) and Occupancy Rate

	Persons Per Household (PPH)			Occupancy Rate		
	2000	2010	Change 2000-2010	2000	2010	Change 2000-2010
Washington County	*2.6*	*2.6*	*0.0*	*94.5%*	*94.6%*	*0.0%*
Banks	2.9	3.2	0.2	89.9%	95.3%	5.4%
Gaston (Washington)	3.1	2.7	-0.4	96.2%	96.0%	-0.2%
North Plains	2.7	2.8	0.1	93.7%	94.3%	0.6%
Outside UGBs	2.8	2.7	-0.1	94.3%	93.4%	-0.9%

Sources: U.S. Census Bureau, 2000 and 2010 Censuses.

Note: For simplicity each UGB is referred to by its primary city's name.

Assumptions for Future Population Change

Evaluating past demographic trends provides clues about what the future will look like and helps determine the most likely scenarios for population change. Past trends also explain the dynamics of population growth specific to local areas. Relating recent and historical change to events that influence population change serves as a gauge for what might realistically occur in a given area over the long-term. The forecast period is 2017-2067.

Assumptions about fertility, mortality, and migration are developed for larger population areas.[4] The assumptions are derived from observations based on life events as well as from trends unique to a given county. We did not use this model to forecast Washington County's sub-areas outside of the county's Metro boundary, as none have a population large enough for this methodology to use (7,000 people or greater).

Population change for smaller sub-areas is determined by the change in the number of total housing units, housing occupancy rates, and PPH. Assumptions around housing unit growth as well as occupancy rates are derived from observations of historical building patterns and current plans for future housing development. In addition, assumptions for PPH are based on observed historical patterns of household demographics — the average age of householder, for example. All of Washington County's sub-areas outside of the Metro boundary fall into this category.

Assumptions for the County

During the forecast period, the population in Washington County is expected to age more quickly during the first half of the forecast period and then remain relatively stable over the forecast horizon. Fertility rates are expected to decline throughout the forecast period. Total fertility in Washington County was 1.88 children per woman during the 2010-15 period and we forecast fertility to gradually fall to 1.72 children per woman by 2065.

Changes in mortality and life expectancy are more stable than fertility and migration. The county is expected to follow the statewide trend of increasing life expectancy throughout the forecast period—progressing from a life expectancy of 82.1 years in 2010 to 89.6 in 2060. In spite of increasing life expectancy and the corresponding increase in survival rates, Washington County's aging population will increase the overall numbers of deaths throughout the forecast period.

Migration is the most volatile and challenging demographic component to forecast due to the many factors influencing migration patterns. Economic, social, and environmental factors—such as employment, educational opportunities, housing availability, family ties, cultural affinity, climate change, and natural amenities—occurring both inside and outside the study area affect both the direction and the volume of migration.

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[4] County sub-areas with populations greater than 7,000 in the forecast launch year were forecast using the cohort-component method. County sub-areas with populations less than 7,000 in forecast launch year were forecast using the housing-unit method. See Glossary of Key Terms at the end of this report for a brief description of these methods or refer to the *Methods* document for a more detailed description of these forecasting techniques.

We assume net migration rates will change in line with historical trends unique to Washington County. Net out-migration of younger persons and net in-migration of middle-aged individuals will continue throughout the forecast period. Countywide average annual net in-migration is expected to increase from 3,968 net in-migrants in 2015 to 6,600 net in-migrants in 2035. Over the last 30 years of the forecast period average annual net in-migration is expected to be more steady, remaining at about 6,600 net in-migrants through 2065. Net in-migration is expected to account for the majority of Washington County's population growth throughout the forecast period.

Assumptions for Smaller Sub-Areas

Rates of population growth for the smaller UGBs are assumed to be determined by corresponding growth in the number of housing units, as well as changes in housing occupancy rates and PPH. The change in housing unit growth is much more variable than change in housing occupancy rates or PPH.

Occupancy rates and PPH are assumed to stay relatively stable over the forecast period. Smaller household size is associated with an aging population in Washington County and its sub-areas.

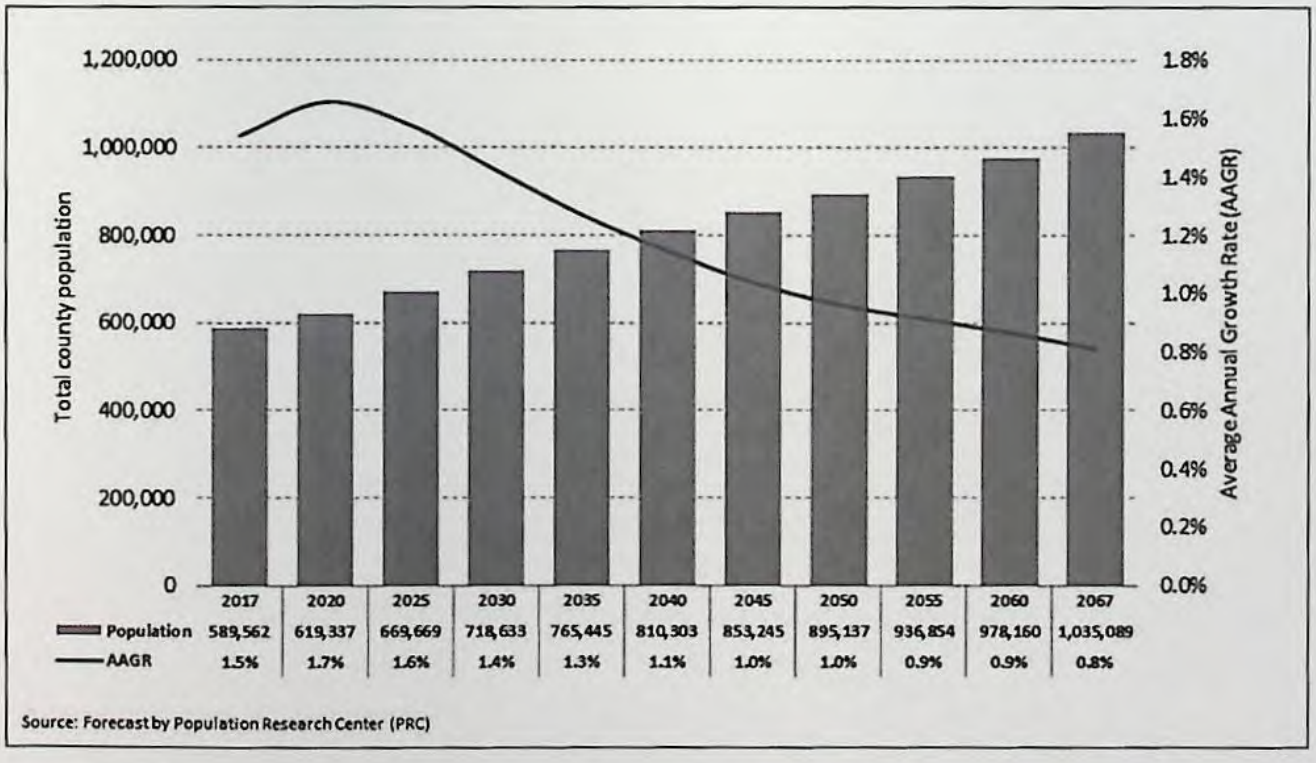
In addition, for sub-areas experiencing population growth, we assume a higher growth rate in the near-term, with growth stabilizing over the remainder of the forecast period. If planned housing units were reported in the surveys, then we account for them being constructed over the next 5-15 years. Finally, for county sub-areas where population growth has been flat or declined, and there is no planned housing construction, we hold population growth mostly stable with little to no change.

Forecast Trends

Under the most-likely population growth scenario for Washington County, countywide and sub-area populations are expected to increase over the forecast period. The countywide population growth rate is forecast to peak in 2020 and then slowly decline for the remainder of the forecast period. A reduction in population growth rates is driven by both (1) an aging population—contributing to steady increase in deaths — as well as (2) the expectation of relatively stable in-migration over the second half of the forecast period. The combination of these factors will likely result in population growth rates slowing as time progresses through the forecast period.

Washington County's total population is forecast to grow by a little more than 445,000 persons from 2017 to 2067, which translates into a total countywide population of 1,035,089 in 2067 (**Figure 15**). The population is forecast to grow at the highest rate—approximately one and a half percent per year—in the near-term (2017-2025). This anticipated population growth in the near-term is based on three core assumptions: (1) Washington County's economy will continue to strengthen in the next 10 years; (2) young adults will continue to migrate into the county—bringing their families or having more children; (3) empty nesters and retirees will migrate into the county, thus increasing deaths. The largest component of growth in this initial period is net in-migration. Roughly 32,100 more deaths than births are forecast for the 2017 to 2025 period. At the same time more than 57,300 in-migrants are also forecast, combining with natural increase and producing strong population growth.

Figure 15. Washington County—Total Forecast Population by Five-year Intervals (2017-2067)



Source: Forecast by Population Research Center (PRC)

Washington County's sub-areas outside the Metro boundary are expected to grow by a combined number of about 4,700 persons from 2017 to 2035, with a combined average annual growth rate of nearly four percent (Figure 16). This growth rate is due to expected rapid growth in Banks and North Plains, with both expected to capture increasing shares of the county's total population over the forecast horizon (Figure 17). The Washington portion of Gaston, however, is expected to capture a stable share of the county's populations. North Plains is expected to experience the highest absolute growth in population over the next 18 years. The UGBs are expected to collectively add roughly 2,330 people from 2035-2067.

Population outside UGBs is expected to decrease by more than 1,800 people from 2017 to 2035 but is expected to decrease at a much slower rate during the second half of the forecast period, only losing a little more than 490 people from 2035 to 2067.

Figure 16. Washington County and Sub-Areas Combined—Forecast Population and AAGR

	2017	2035	2067	AAGR (2017-2035)	AAGR (2035-2067)	Share of County 2017	Share of County 2035	Share of County 2067
Washington County	*589,562*	*765,445*	*1,035,089*	*1.5%*	*0.9%*	*100.0%*	*100.0%*	*100.0%*
Outside UGBs	25,566	23,724	23,233	-0.4%	-0.1%	4.3%	3.1%	2.2%
Smaller UGBs	4,828	9,501	11,832	3.8%	0.7%	0.8%	1.2%	1.1%

Source: Forecast by Population Research Center (PRC)

Note: Smaller UGBs are those with populations less than 7,000 in forecast launch year.

Figure 17. Washington County and Smaller Sub-Areas—Forecast Population and AAGR

	2017	2035	2067	AAGR (2017-2035)	AAGR (2035-2067)	Share of County 2017	Share of County 2035	Share of County 2067
Washington County	*589,562*	*765,445*	*1,035,089*	*1.5%*	*0.9%*	*100.0%*	*100.0%*	*100.0%*
Banks UGB	1,908	2,887	3,388	2.3%	0.5%	0.3%	0.4%	0.3%
Gaston UGB (Washington)	654	691	726	0.3%	0.2%	0.1%	0.1%	0.1%
North Plains UGB	2,266	5,922	7,718	5.5%	0.8%	0.4%	0.8%	0.7%
Outside UGBs	25,566	23,724	23,233	-0.4%	-0.1%	4.3%	3.1%	2.2%

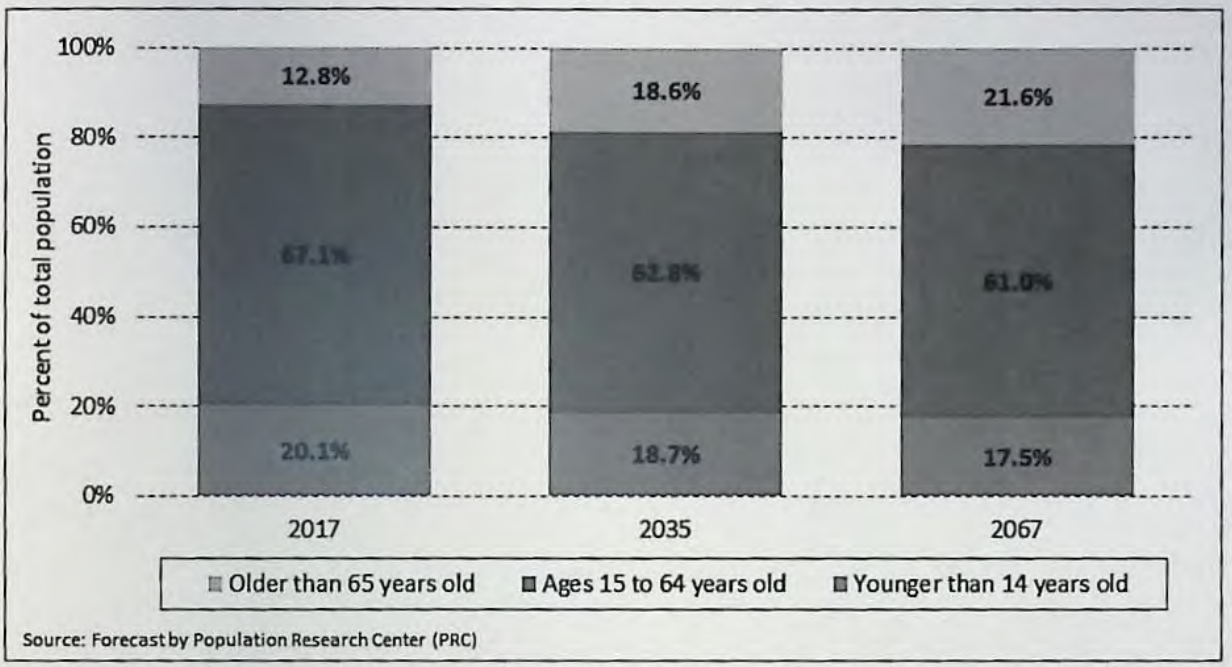
Source: Forecast by Population Research Center (PRC)

Note: PRC does not forecast populations within the Metro area. As a result, population numbers and shares do not add up in this table.

Forecast Trends in Components of Population Change

As previously discussed, a key factor in increasing deaths is an aging population. From 2017 to 2035 the proportion of county population 65 or older is forecast to grow from roughly 13 percent to about 19 percent; however the proportion of the population 65 or older is expected to increase at a slower rate ending at 22 percent by 2067 (Figure 18). For a more detailed look at the age structure of Washington County's population see the final forecast table published to the forecast program website (http://www.pdx.edu/prc/opfp).

Figure 18. Washington County—Age Structure of the Population (2017, 2035, and 2067)

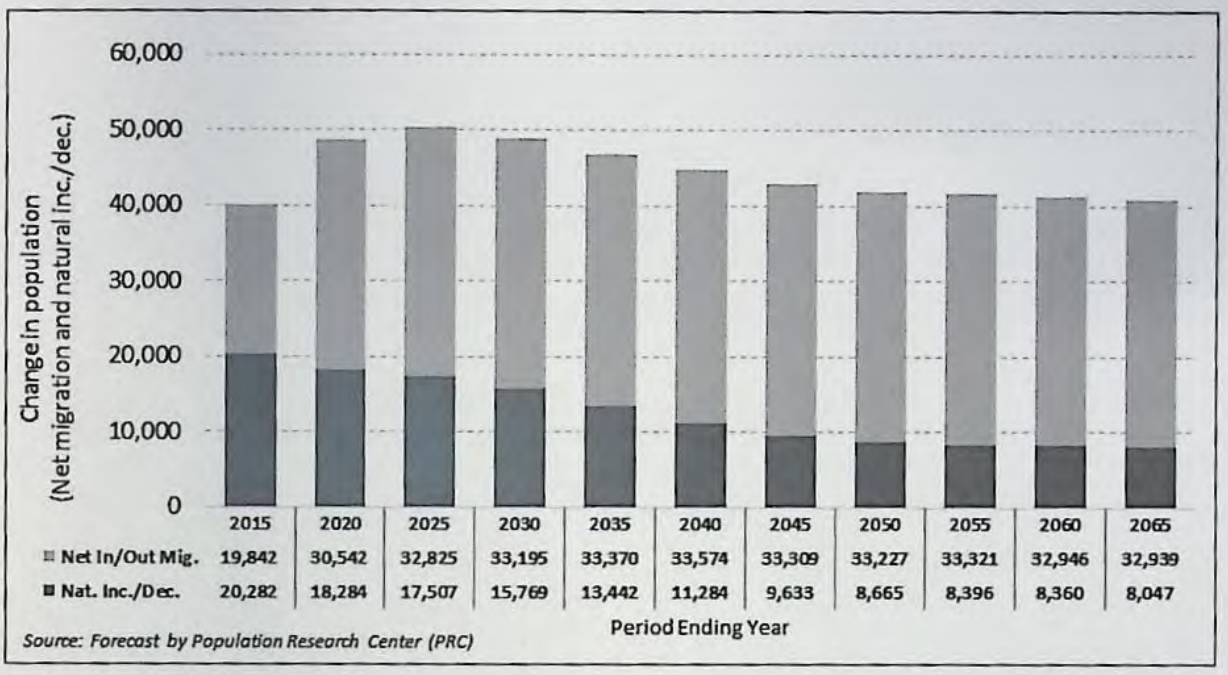


As the countywide population ages in the near-term and more women choose to have fewer children and have them at older ages, the increase in average annual births is expected to slow. This, combined with the rise in number of deaths, is expected to cause natural increase to decrease in magnitude (Figure 19).

Net in-migration is forecast to increase rapidly in the near-term and then remain relatively stable over the remainder of the forecast period. The majority of these net in-migrants are expected to be adults in their 20s and 30s.

In summary, a diminishing natural increase and steady net in-migration are expected to lead to population growth reaching its peak in 2020 and then slightly tapering through the remainder of the forecast period (Figure 19). An aging population is expected to lead to an increase in deaths, and a smaller proportion of women in their childbearing years will likely result in a long-term decline in birth rates. Net in-migration is expected to remain relatively steady throughout the forecast period and therefore will complement natural increase.

Figure 19. Washington County—Components of Population Change, 2015-2065



Source: Forecast by Population Research Center (PRC)

Glossary of Key Terms

Cohort-Component Method: A method used to forecast future populations based on changes in births, deaths, and migration over time.

Coordinated population forecast: A population forecast prepared for the county along with population forecasts for its urban growth boundary (UGB) areas and non-UGB area.

Housing unit: A house, apartment, mobile home or trailer, group of rooms, or single room that is occupied or is intended for occupancy.

Housing-Unit Method: A method used to forecast future populations based on changes in housing unit counts, vacancy rates, the average numbers of persons per household (PPH), and group quarter population counts.

Occupancy rate: The proportion of total housing units that are occupied by an individual or group of persons.

Persons per household (PPH): The average household size (i.e. the average number of persons per occupied housing unit).

Replacement Level Fertility: The average number of children each woman needs to bear in order to replace the population (to replace each male and female) under current mortality conditions in the U.S. This is commonly estimated to be 2.1 children per woman.

Appendix A: Surveys and Supporting Information

Supporting information is based on planning documents and reports, and from submissions to PRC from city officials and staff, and other stakeholders. The information pertains to characteristics of each city area, and to changes thought to occur in the future. The city of Gaston did not submit survey responses.

Banks — Washington County— 10/3/2016						
Observations about Population Composition (e.g. about children, the elderly, racial ethnic groups)	**Observations about Housing (including vacancy rates)**	**Planned Housing Development/ Est. Year Completion**	**Future Group quarters Facilities**	**Future Employers**	**Infrastructure**	**Promotions (Promos) and Hindrances (Hinders) to Population and Housing Growth; Other notes**
	Significant UGB expansion a few years ago and poised for significant new housing development. Elected officials appear interested in enlarging some minimum lot sizes for higher end housing. Also need to consider "spillover" from Metro region and					**Promos:** As noted, recent UGB expansion. Planned and zoned for significant number of households with I believe a larger than average HH size. Note that the city has their own K-12 school system which is located on the main street. Current Banks-Vernonia Trail and possible future Salmonberry Trail from Banks to Tillamook. Golf Course. **Hinders:**

	demand for more affordable housing.					
Highlights or summary from planning documents of influences on or anticipation of population and housing growth (including any plans for UGB expansion and the stage in the expansion process)	N/A					

Banks — Washington County— 10/3/2016	
Other information (e.g. planning documents, email correspondence, housing development survey)	**According to PRC background research:** - Between the recent UGB expansion and the low rates of population growth in recent years, it would seem that Banks likely does not have significant constraints on developable employment lands or residential lands.

Gaston — Washington County— NO RESPONSE						
Observations about Population Composition (e.g. about children, the elderly, racial ethnic groups)	Observations about Housing (including vacancy rates)	Planned Housing Development/Est. Year Completion	Future Group quarters Facilities	Future Employers	Infrastructure	Promotions (Promos) and Hindrances (Hinders) to Population and Housing Growth; Other notes
Highlights or summary from planning documents of influences on or anticipation of population and housing growth (including any plans for UGB expansion and						

Gaston — Washington County— NO RESPONSE	
the stage in the expansion process)	
Other information (e.g. planning documents, email correspondence, housing development survey)	

North Plains — Washington County— 11/14/2016						
Observations about Population Composition (e.g. about children, the elderly, racial ethnic groups)	**Observations about Housing (including vacancy rates)**	**Planned Housing Development/Est. Year Completion**	**Future Group quarters Facilities**	**Future Employers**	**Infrastructure**	**Promotions (Promos) and Hindrances (Hinders) to Population and Housing Growth; Other notes**
The age distribution of North Plains is similar to Washington County with a slightly smaller share of people over 60 years old.	Significant new housing development in past couple of years and continuing. Elected officials have expressed concern about the appearance of some (previous) higher density housing and DLCD has been encouraging the city to consider development code modifications to improve space	The City expects to build out all vacant land, except for small infill, with the development that is proposed, as documented through building permits	None	There has been interest in employers considering locating in the area, but no definitive plans now.	In 2005 the City tied into the Hillsboro Water supply with a 1 million gal per day capacity, currently we are using only 20% of that amount. Clean Water Services has designed the system and the 2014 lift station for above maximum build out.	**Promos:** The city does have a large area of "undesignated" lands surrounding the UGB, so the opportunity is there for further expansion. **Hinders:** Once the vacant land is built out, North Plains will not have sufficient buildable lands to accommodate additional housing.

North Plains — Washington County— 11/14/2016						
	efficient housing options to minimize pressure to increase minimum lot sizes. The city was recently awarded a TGM Education and Outreach grant for a workshop on housing design.					
Highlights or summary from planning documents of influences on or anticipation of population and housing growth (including any plans for UGB expansion and the stage in the expansion process)	A UGB expansion may be in their future. On account of the relatively high cost of housing in the Metro region in general and the increasing cost in Hillsboro in particular, consideration should be given to how projected housing costs in North Plains relative to the surrounding area may affect their future growth. Also may want to consider public transportation plans, HH transportation costs and their potential impact on residential affordability. The City is in the process of evaluating the sufficiency of land for commercial and industrial growth. Once the preliminary population forecast is available, the City will complete a housing needs analysis as well. These studies may or may not lead to a UGB expansion.					

North Plains — Washington County— 11/14/2016	
Other information (e.g. planning documents, email correspondence, housing development survey)	North Plains is/was assessing its employment and residential land needs throughout this forecasting process.

Unincorporated Area — Washington County— 11/14/2016						
Observations about Population Composition (e.g. about children, the elderly, racial ethnic groups)	**Observations about Housing (including vacancy rates)**	**Planned Housing Developmen t/Est. Year Completion**	**Future Group quarters Facilities**	**Future Employers**	**Infrastructure**	**Promotions (Promos) and Hindrances (Hinders) to Population and Housing Growth; Other notes**

Unincorporated Area — Washington County— 11/14/2016						
Washington County is increasingly diverse in terms of racial and ethnic identity. The County has a large percentage of families with children.	New single family housing built in Washington County is generally suited for families with children. There is limited housing potential in the rural unincorporated area.	55 SFR units planned in the pipeline, 2 of which are under review and 53 have been approved.	Unknown, unlikely in rural unincorporated area	Unknown	Washington County requires development of infrastructure finance plans as a part of concept planning for new areas. This supports the county's ability to provide necessary infrastructure. This applies to development in the cities, which will use county transportation system.	**Promos:** **Hinders:**

Unincorporated Area — Washington County— 11/14/2016	
Highlights or summary from planning documents of influences on or anticipation of population and housing growth (including any plans for UGB expansion and the stage in the expansion process)	Washington County has no plans for UGB expansions that will remain as unincorporated areas.
Other information (e.g. planning documents, email correspondence, housing development survey)	**According to PRC background research:** - The vast majority of vacant buildable lands in the urban unincorporated area are currently designated for Low Density Residential development; only a small percentage of the remaining 14,871 acres are now slated for commercial and industrial uses. Vacant buildable industrial lands in the urban unincorporated are concentrated in three community planning areas: Sunset West, West Union, and Sherwood-Tualatin.

Appendix B: Specific Assumptions

Banks

The 5-year average annual housing unit growth rate is assumed to rapidly increase from 1.1 percent to 4.75 percent during the first 10 years and then rapidly decline thereafter. The occupancy rate is assumed to be steady at 95.3 percent throughout the 50 year horizon. PPH is assumed to be stable at 3.16 over the forecast period. There is no group quarters population in Banks.

Gaston

The 5-year average annual housing unit growth rate is assumed to decline throughout the forecast period. The occupancy rate is assumed be steady at 96 percent throughout the 50 year horizon. PPH is assumed to be stable at 2.66 over the forecast period. There is no group quarters population in Gaston.

North Plains

The 5-year average annual housing unit growth rate is assumed to rapidly decline throughout the forecast period. The occupancy rate is assumed to be steady at 94.3 percent throughout the 50 year horizon. PPH is assumed to be stable at 2.75 over the forecast period. Group quarters population is assumed to remain at 8.

Outside UGBs

The 5-year average annual housing unit growth rate is assumed to decline throughout the forecast period. The occupancy rate is assumed to steadily decrease from 93.3 percent to 92.1 percent throughout the 50 year horizon. PPH is assumed to rapidly decrease from 2.71 to 2.46 during the first half of the forecast period and then remain steady thereafter. Group quarters population is assumed to remain at 70.

Appendix C: Detailed Population Forecast Results

Figure 20. Washington County—Population by Five-Year Age Group

Population Forecasts by Age Group / Year	2017	2020	2025	2030	2035	2040	2045	2050	2055	2060	2065	2067
00-04	39,803	40,771	43,819	46,420	48,474	50,428	52,221	54,123	56,356	58,576	60,456	61,086
05-09	39,780	40,034	41,923	45,147	47,711	49,751	51,631	53,338	55,172	57,337	59,528	60,264
10-14	38,995	40,675	41,358	43,395	46,620	49,197	51,177	52,983	54,629	56,399	58,544	59,408
15-19	36,097	36,954	39,899	40,612	42,637	45,831	48,343	50,266	52,043	53,662	55,449	56,310
20-24	35,535	36,710	38,227	41,160	41,797	43,822	46,996	49,456	51,328	53,044	54,636	55,339
25-29	45,989	48,385	50,809	52,454	56,012	56,445	58,680	62,395	65,122	67,028	68,734	69,342
30-34	44,792	47,443	51,696	54,141	55,767	59,471	59,795	62,022	65,829	68,583	70,516	71,207
35-39	44,001	44,625	49,181	53,452	55,845	57,448	61,124	61,315	63,484	67,258	69,999	70,761
40-44	42,134	43,235	44,325	48,863	53,152	55,618	57,198	60,840	61,040	63,212	66,902	67,960
45-49	40,744	41,689	43,619	44,609	49,074	53,338	55,677	57,136	60,674	60,769	62,875	64,303
50-54	38,599	39,666	41,285	43,097	44,077	48,538	52,759	55,070	56,542	60,074	60,245	61,111
55-59	36,071	37,600	39,395	40,883	42,667	43,649	48,030	52,175	54,435	55,872	59,391	59,477
60-64	31,703	34,012	36,520	38,204	39,609	41,345	42,241	46,418	50,388	52,512	53,893	55,230
65-69	25,412	29,000	32,766	35,206	36,879	38,326	40,064	40,983	45,112	48,911	50,947	51,476
70-74	18,626	22,115	27,635	31,173	33,430	35,045	36,419	38,086	38,944	42,844	46,484	47,247
75-79	12,785	15,814	20,380	25,233	28,208	30,285	31,781	33,066	34,644	35,465	39,089	40,423
80-84	8,688	10,028	13,901	17,479	21,283	23,635	25,401	26,735	27,919	29,373	30,171	31,412
85+	9,797	10,582	12,931	17,107	22,203	28,131	33,707	38,730	43,192	47,241	51,290	52,728
Total	589,562	619,337	669,669	718,633	765,445	810,303	853,245	895,137	936,854	978,160	1,019,146	1,035,089

Population Forecasts prepared by: Population Research Center, Portland State University, June 30, 2017.

Figure 21. Washington County's Sub-Areas—Total Population

Area / Year	2017	2020	2025	2030	2035	2040	2045	2050	2055	2060	2065	2067
Washington County	589,562	619,337	669,669	718,633	765,445	810,303	853,245	895,137	936,854	978,160	1,019,146	1,035,089
Banks UGB	1,908	1,957	2,469	2,811	2,887	2,961	3,035	3,112	3,189	3,271	3,353	3,388
Gaston UGB (Washington)	654	662	674	683	691	698	705	710	715	720	724	726
North Plains UGB	2,266	3,054	4,410	5,245	5,922	6,352	6,727	7,045	7,292	7,466	7,640	7,718
Outside UGB Area	25,566	25,309	24,317	23,876	23,724	23,710	23,656	23,576	23,502	23,436	23,310	23,233

Population Forecasts prepared by: Population Research Center, Portland State University, June 30, 2017.

"Development Limitations Worksheet"

▸ Table 1 – EXTENDED MU/QM PERMIT INFORMATION (Reviewer):

Application:	G-8476	**Permit:**	G-7593
Permit Holder:	City of Banks		
Date of Permit Issuance:	12-2-1977	**Max. Rate (or Volume) Allowed Under Permit (CFS/AF):**	0.67 cfs
Permit has condition requiring submittal of a WMCP? ~~YES~~ (NO) ~~..If YES, indicate WMCP Due Date established by permit condition:~~			

▸ Table 2 – LISTING OF DEVELOPMENT LIMITATIONS (Reviewer & Support Staff):

➔ ☑ The **Reviewer** will **PULL** the physical permit file to ensure ***all*** applicable Final Orders (EXT & WMCP) are captured below.

REVIEWER: RECORD (HERE) all "DEVELOPMENT LIMITATIONS" established by conditions in EXTENSION FO's and WMCP FO's		**SUPPORT STAFF:** ASSIGN & RECORD (HERE) Sp. Or. Volume & Pg. #'s for EXTENSION FO's
EXTENSION Final Order (Div 315) with/without "Development Limitations" Condition		***NEWLY ASSIGNED*** **Sp. Or. Volume & Page:**
EXT FO #1	o Date of Extension Final Order Issuance: 11-20-2008 o Extended Completion Date(s): 10-1-2017 o WMCP due date: 11-20-2011 o MAX div. rate/volume under Development Limitations: 0.613 (CFS) ~~AF~~	Sp. Or. Vol. _____, Pg. _____
EXT FO #2	o Date of Extension Final Order Issuance: _____ o Extended Completion Date(s): _____ o WMCP due date: _____ o MAX div. rate/volume under Development Limitations: _____ (CFS/AF)	Sp. Or. Vol. _____, Pg. _____
EXT FO #3	o Date of Extension Final Order Issuance: _____ o Extended Completion Date(s): _____ o WMCP due date: _____ o MAX div. rate/volume under Development Limitations: _____ (CFS/AF)	Sp. Or. Vol. _____, Pg. _____
WMCP Final Order with/without "Development Limitations" Condition		***ALREADY*** **ASSIGNED on WMCP FO:**
➔	Was more time allowed to submit the WMCP? ~~YES~~ (NO) ~~If YES, what is new due date?~~ o WMCP Extended Due Date: —N/A—	➔ **ENTER** ~~the new "extended" WMCP due date as~~ a Workflow Item and **SCAN** ~~a copy of the letter granting the additional time into~~ WRIS. (The letter will NOT have Sp. Or. Vol & Pg #s)
WMCP FO #1	o Date of WMCP Final Order Issuance: 8-10-2010 o Due date for WMCP 5-Year Progress Report: 8-9-2015 o Due date for submittal of updated WMCP: 8-9-2020 o Date through which WMCP is "in effect": 8-9-2020 o MAX div. rate/volume under Development Limitations: 0.67 (CFS) ~~AF~~	Sp. Or. Vol. 81, Pg. 661
WMCP FO #2	o Date of WMCP Final Order Issuance: _____ o Due date for WMCP 5-Year Progress Report: _____ o Due date for submittal of updated WMCP: _____ o Date through which WMCP is in effect: _____ o MAX div. rate/volume under Development Limitations: _____ (CFS/AF)	Sp. Or. Vol. _____, Pg. _____

Last Revised: December 9, 2015
By: Lisa Jaramillo

▸ Table 3 – REVIEW SECTION (Reviewer):

Performed by: Lisa Jaramillo	Date: 12-11-2015

1. ☑ **REVIEW** and **COMPARE** the following: (See: Extension FO & WMCP FO info in "**Table 2 – LISTING OF DEVELOPMENT LIMITATIONS**" above.)
- **A)** The maximum **permitted** amount of water specified in the permit
- **B)** For <u>each</u> **Extension Final Order** with a "Development Limitations" condition, the specified maximum diversion rate/volume
- **C)** For <u>each</u> **WMCP Final Order** with a "Development Limitations" condition, the specified maximum diversion rate/volume

2. ☑ **DETERMINE** the "**Currently Authorized MAXIMUM Diversion Rate/Volume**" for the permit.
→ Generally, the "Development Limitation" rate/volume imposed *<u>by the most recent Final Order</u> (Extension or WMCP)* is the **MAXIMUM amount that may legally be diverted under the permit <u>at this time</u> (i.e., the Current Development Limitation).**

3. ☑ **CHECK** information in "**Table 2 – LISTING OF DEVELOPMENT LIMITATIONS**" <u>against</u> the "**WMCP Database**" in Access to:
- Ensure all Extension FOs requiring <u>submittal of a WMCP</u> are **captured and accurately reflected** in the WMCP Database; and
- Ensure the **maximum diversion rate/volume** in the Development Limitations (Greenlight) tracking in the WMCP database is captured & accurate.

4. **REVIEWER: RECORD** (here) your ultimate determination of the subject permit's:

☑ **CURRENT Authorized MAXIMUM Diversion Rate/Volume** (Development Limitation): 0.67 cfs
Established by (*check the appropriate one*): ~~☐ Permit~~ ~~☐ Extension Final Order~~ ☑ **WMCP Final Order**
Determination is based upon comparison of all Extension & WMCP Final Orders containing a "Development Limitations" condition (*see: "Table 2 – Listing of Development Limitations" above*). (**NOTE:** Diversion of water beyond this rate/volume limitation is **not** legally authorized as this time.)

☑ **CURRENT Extended Completion Date(s):** 10-1-2017
Determination is based upon review of the Extension Final Orders for the subject permit.

☑ **CURRENT Due Date for Submittal of the Required WMCP:** 8-9-2020
Established by (*check the appropriate one*): ~~☐ Permit~~ ☐ ~~Extension Final Order~~ ☒ **WMCP Final Order**
Determination based on comparison of all Extension and WMCP FOs with a condition requiring submittal of a WMCP (*see: "Table 2 - Listing of Development Limitations" above*), and a review of the WMCP Database to compare the dates of any previous WMCPs already submitted to OWRD.

5. ☑ **FORWARD** the completed "**Development Limitations Worksheet**" to **PEER REVIEWER** for their review.

▸ Table 4 – PEER REVIEWER SECTION (Peer Reviewer – WMCP Staff):

Performed by: Steven Parnell	Date: 12-23-15

1. ☑ **PERFORM** Items #1 - #4 in "**Table 3 – Review Section**" above.
☑ Are findings in **AGREEMENT** with Reviewer? ☑ YES ☐ NO – If NO, discuss with Reviewer and resolve. Modify **Table 5 (Items #2-#4)** as needed.

2. ☐ **FORWARD** the completed "**Development Limitations Worksheet**" and physical file to **SUPPORT STAFF** for Data Entry.

▸ Table 5 – DATA ENTRY SECTION (Support Staff):

Performed by:	Date:

1. **Data Entry Actions:** See: "**Data Entry Procedures (MU/QM Permit Extension Final Orders**" for further instruction.

☐ **ASSIGN** Sp. Or. Vol. & Pg. #'s to <u>**Extension Final Orders only**</u>... and ☐ **MAKE** a copy for the permit file.
☐ **RECORD** the Sp. Or. Vol. & Pg. #'s on this sheet in "**Table 2 - LISTING OF DEVELOPMENT LIMITATIONS**" above.

SCAN all of the following, as appropriate:
☐ <u>**Extension PROPOSED Final Order**</u> .....if <u>not</u> already under "<u>View all scanned documents</u>" in WRIS.
- o **DELETE** the <u>existing</u> Extension Final Order that does <u>NOT</u> have Sp. Or. Vol. &Pg. #'s assigned to it.

☐ <u>**Extension Final Orders**</u> with newly assigned Sp. Or. Vol. & Pg. numbers <u>and</u> **ATTACH** in **WRIS.**
- o **UPDATE "Description"** for **Extension FO** Sp. Or. to identify "**Development Limitation**" (*if applicable*) -See **Table 2**

☐ <u>**WMCP Final Orders**</u> .....if <u>not</u> already scanned and attached in WRIS under "Order(s)".
- o **UPDATE "Description"** for **WMCP FO** Sp. Or. to identify "**Development Limitation**" *(if applicable)* – See **Table 2**

UPDATE WORKFLOW, as follows:
☐ <u>**Permit Workflow**</u> - if the permit included a condition requiring submittal of a WMCP (see **Table 1** above), then....
- o **ENTER** .....Due date for submittal of WMCP: _____ Workflow Item: "**WMCP Due Date (Permit)**"

☐ <u>**Extension Workflow Action Items**</u>, as applicable. Refer to **Table 2** and **Table 3 (#4)** above.
- o Date of Extension Final Order Issuance
- o Extended Completion Date(s)
- o Due date for submittal of WMCP (*if applicable*) **NOTE:** Use Workflow Item: "**WMCP Due Date (Ext FO)**"

☐ <u>**WMCP Workflow Action Items**</u>, as applicable. Refer to **Table 2** and **Table 3 (#4)** above.
- o WMCP Extended Due Date (*if applicable*)
- o Date of WMCP Final Order Issuance
- o Due date for WMCP 5-Year Progress Report
- o Due date for submittal of updated WMCP **NOTE:** Use Workflow Item: "**WMCP Due Date (WMCP)**"
- o Date through which WMCP is in effect

Oregon Water Resources Department
Water Rights Division

Water Rights Application
Number G-8476

Final Order
Extension of Time for Permit Number G-7593

Appeal Rights

This is a final order in other than contested case. This order is subject to judicial review under ORS 183.484. Any petition for judicial review must be filed within the 60 day time period specified by ORS 183.484(2). Pursuant to ORS 536.075 and OAR 137-004-0080 you may either petition for judicial review or petition the Director for reconsideration of this order. A petition for reconsideration may be granted or denied by the Director, and if no action is taken within 60 days following the date the petition was filed, the petition shall be deemed denied.

Application History

The Department issued Permit G-7593 on December 2, 1977. The permit called for completion of construction by October 1, 1979, and complete application of water to beneficial use by October 1, 1980. On May 17, 2007, the City of Banks submitted an application to the Department for an extension of time for Permit G-7593. In accordance with OAR 690-315-0050(2), on September 11, 2007, the Department issued a Proposed Final Order proposing to extend the time to complete construction to October 1, 2017 and to extend the time to fully apply water to beneficial use to October 1, 2017. The protest period closed October 26, 2007, in accordance with OAR 690-315-0060(1). No protest was filed.

At time of issuance of the Proposed Final Order the Department concluded that, based on the factors demonstrated by the applicant, the permit may be extended subject to the following conditions:

CONDITIONS

1. **Development Limitations**

Diversion of any water beyond 0.613 cfs under Permit G-7593 shall only be authorized upon issuance of a final order approving a Water Management and Conservation Plan (WMCP) under OAR Chapter 690, Division 86. The required WMCP shall be submitted to the Department within 3 years of an approved extension application. Use of water under Permit G-7593 must be consistent with this and subsequent WMCP's approved under OAR Chapter 690, Division 86 on file with the Department.

The deadline established in this PFO for submittal of a WMCP shall not relieve a permit holder of any existing or future requirement for submittal of a WMCP at an earlier date as

established through other orders of the Department. A WMCP submitted to meet the requirements of this order may also meet the WMCP submittal requirements of other Department orders.

The applicant has demonstrated good cause for the permit extension pursuant to ORS 537.630, 539.010(5) and OAR 690-315-0080(3).

Order

The extension of time for Application G-8476, Permit G-7593, therefore, is approved subject to conditions contained herein. The deadline for completing construction is extended to October 1, 2017. The deadline for applying water to full beneficial use is extended to October 1, 2017.

DATED: November 20, 2008

Dwight French, Administrator of
Water Rights and Adjudications
for
Phillip C. Ward, Director

If you have any questions about statements contained in this document, please contact Ann L. Reece at (503) 986-0827.

If you have other questions about the Department or any of its programs, please contact our Water Resources Customer Service Group at (503) 986-0900.

Oregon Water Resources Department
Water Rights Division

Application for Extension of Time

In the Matter of the Application for an Extension of Time for Permit G-7593, Water Right Application G-8476, in the name of the City of Banks	)))	PROPOSED FINAL ORDER

Permit Information

Application File G-8476 / Permit G-7593
Basin 02 – Willamette Basin / Watermaster District 18
Date of Priority: September 29, 1977

Authorized Use of Water

Source of Water:	A Well in the Willamette Basin
Purpose or Use:	Municipal
Maximum Rate:	0.67 Cubic Feet per Second

This Extension of Time request is being processed in accordance with Oregon Administrative Rule Chapter 690, Division 315.

Please read this Proposed Final Order in its entirety as it contains additional conditions not included in the original permit.

This Proposed Final Order applies only to Permit G-7593, water right Application G-8476. A copy of Permit G-7593 is enclosed as Attachment 1.

Summary of Proposed Final Order for Extension of Time

The Department proposes to:

- grant an extension of time to complete construction of the water system from October 1, 1979 to October 1, 2017; and
- grant an extension of time to apply water to full beneficial use from October 1, 1980 to October 1, 2017.
- make the extension of time subject to certain conditions as set forth below.

ACRONYM QUICK REFERENCE

Department – Oregon Department of Water Resources
City – City of Banks
ODFW – Oregon Department of Fish and Wildlife
PFO – Proposed Final Order
WMCP – Water Management and Conservation Plan

Units of Measure
cfs – cubic feet per second
gpm – gallons per minute

AUTHORITY

Generally, see ORS 537.630 and OAR Chapter 690 Division 315.

ORS 537.630(2) provides in pertinent part that the Oregon Water Resources Department (Department) may, for good cause shown, shall order and allow an extension of time, for the completion of the well or other means of developing and securing the ground water or for complete application of water to beneficial use. In determining the extension, the department shall give due weight to the considerations described under ORS 539.010 (5) and to whether other governmental requirements relating to the project have significantly delayed completion of construction or perfection of the right.

ORS 539.010(5) provides in pertinent part that the Water Resources Director, for good cause shown, may extend the time within which the full amount of the water appropriated shall be applied to a beneficial use. This statute instructs the Director to consider: the cost of the appropriation and application of the water to a beneficial purpose; the good faith of the appropriator; the market for water or power to be supplied; the present demands therefore; and the income or use that may be required to provide fair and reasonable returns upon the investment.

OAR 690-315-0080 provides in pertinent part that the Department shall make findings to determine if an extension of time for municipal and/or quasi-municipal water use permit holders may be approved to complete construction and/or apply water to full beneficial use. Under specific circumstances, the Department may condition extensions of time for municipal water use permit holders to provide that use of the undeveloped portion of the permit maintains the persistence of listed fish species in the portions of the waterways affected by water use under the permit.

OAR 690-315-0090(3) authorizes the Department, under specific circumstances, to condition an extension of time for municipal and/or quasi-municipal water use permit holders to provide that diversion of water beyond the maximum rate diverted under the permit or previous extension(s) shall only be authorized upon issuance of a final order approving a Water Management and Conservation Plan under OAR Chapter 690, Division 86.

FINDINGS OF FACT

Background

1. Permit G-7593 was granted by the Department on December 2, 1977. The permit authorizes the use of up to 0.67 cfs of water from a well (Behrman Well) within the Willamette Basin, for municipal use. It specified that construction of the water development project was to be completed by October 1, 1979, and that complete application of water was to be made on or before October 1, 1980.

2. Due to an ongoing permit extension rulemaking, the Department placed all pending Applications for Extension of Time for municipal and quasi-municipal permits on hold and did not require municipal and quasi-municipal water use permit holders to submit Applications for Extension of Time until the new rules were adopted.

3. Municipal and quasi-municipal water use permit extension rules OAR 690-315-0070 through 690-315-0100 became effective on November 1, 2002, were amended, filed with the Secretary of State, and became effective on November 22, 2005.

4. The City of Banks, (City) submitted an "Application for Extension of Time" to the Department on May 17, 2007, requesting the time in which to complete construction of the water system be extended from October 1, 1979 to October 1, 2017 and the time to apply water to full beneficial use under the terms of Permit G-7593 be extended from October 1, 1980 to October 1, 2017. This is the first extension of time request for Permit G-7593.

5. Notification of the City's Application for Extension of Time for Permit G-7593 was published in the Department's Public Notice dated May 22, 2007. No public comments were received regarding the extension application.

Review Criteria for Municipal Quasi-Municipal Water Use Permits [OAR 690-315-0080(1)]

The time limits to complete construction and/or apply water to full beneficial use may be extended if the Department finds that the permit holder has met the requirements set forth under OAR 690-315-0080. This determination shall consider the applicable requirements of ORS 537.230[1], 537.248[2], 537.630[3] and/or 539.010(5)[4]

Complete Extension of Time Application [OAR 690-315-0080(1)(a)]

6. On May 17, 2007, the Department received a completed Application for Extension of Time

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[1] ORS 537.230 applies to surface water permits only.

[2] ORS 537.248 applies to reservoir permits only.

[3] ORS 537.630 applies to ground water permits only.

[4] ORS 537.010(5) applies to surface water and ground water permits.

and the fee required by ORS 536.050 from the permit holder.

Start of Construction [OAR 690-315-0080(1)(b)]

7. Ground water permits held by municipal corporations for municipal purposes are not subject to the requirement to begin actual construction work within one year from the date of approval of the application.[5]

Duration of Extension [OAR 690-315-0080(1)(c)(d)]

Under OAR 690-315-0080(1)(c),(d), in order to approve an extension of time for municipal and quasi-municipal water use permits the Department must find that the time requested is reasonable and the applicant can complete the project within the time requested.

8. The remaining work to be accomplished under Permit G-7593 consists of receiving approval from the Department for Permit Amendment T-10055, completing construction of the water system and complete application of water to beneficial use.

9. As of May 17, 2007, the permit holder has appropriated 0.613 cfs of the 0.67 cfs of water authorized under Permit G-7593 for municipal purposes.

10. In addition to the 0.67 cfs of water authorized under Permit G-7593, the City of Banks holds following rights:

    - Certificate 5353 for 0.42 cfs of water from a Spring, a tributary to Dairy Creek; and
    - Certificate 83138 for 0.18 cfs of water from two unnamed streams, tributaries of the West Fork of Dairy Creek.

    The City's permit and water right certificates total 0.67 cfs of ground water and 0.6 cfs of live flow (surface) water. Seasonal limitations and senior water rights held by surrounding areas restrict the City's available surface water supply during peak summertime demands. High turbidity in water used under Certificate 5353 requires treatment prior to reaching the slow sand filter, further limiting water use.

11. In 2007, the City of Banks served 1,876 residential users. According to the City, this figure comprises the population within the City of Banks' principal service area (defined as the city limits of the City of Banks) and a small number of homes served outside the city limits. The City projects a population of 3,739 residential users by the year 2024, which calculates to a population growth rate of approximately 5.3 percent per year. At this growth rate, the

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[5] Section 5, chapter 410, Oregon Laws 2005, provides:

Sec. 5. (2) The amendments to ORS 537.230 and 537.630 by sections 1 and 2 of this 2005 Act apply to requests for extensions of time to complete construction or to perfect a water right made before, on or after the effective date of this 2005 Act, whether or not construction has commenced under a permit prior to the request.

(3) All final orders by the department that resulted in the issuance of a water right permit, the issuance of a water right certificate or the approval of an extension of time to complete construction or to perfect a water right for a municipal use that were issued before the effective date of this 2005 Act are not subject to challenge in an administrative or judicial proceeding with respect to the requirement to commence and complete construction within a specified period of time. [2005 c.410 §5]

population calculates to be 3,187 residential users in 2017.

12. In 2007, the City utilized a peak demand of 0.51 cfs of water. They are using water authorized under Certificate 5353, Certificate 83138 and Permit G-7593 to meet its present demand for water.

13. According to the City's Water Management and Conservation Plan (Table 4-7, Page 4-9), their projected peak demand is expected to be 0.85 cfs of water in 2015.

14. Full development of Permit G-7593 is needed to address the present and future water demand of the City.

15. The City's request for an extension of time until October 1, 2017 to complete construction of the water system and to apply water to full beneficial use under the terms of Permit G-75693 is both reasonable and necessary.

Good Cause [OAR 690-315-0080(1)(e) and (3)(a-g)and (4)]
The Department's determination of good cause shall consider the requirements set forth under OAR 690-315-0080(3).

Reasonable Diligence and Good Faith of the Appropriator [OAR 690-315-0080(3)(a),(c) and (4)]
Reasonable diligence and good faith of the appropriator must be demonstrated during the permit period or prior extension period as a part of evaluating good cause in determining whether or not to grant an extension. In determining the reasonable diligence and good faith of a municipal or quasi-municipal water use permit holder, the Department shall consider activities associated with the development of the right including, but not limited to, the items set forth under OAR 690-315-0080(4) and shall evaluate how well the applicant met the conditions of the permit or conditions of a prior extension period.

16. During the original development time frame under Permit G-7593, being from October 1, 1979 October 1, 1980, the following work was completed by the City:

- construction of the Behrman well;
- construction of 6-inch transmission pipes; and
- construction of reservoirs for storage of ground water.

17. Since October 1, 1980, the City has accomplished, in part, the following:

- construction of a second well;
- obtained Department approval of a Water Management and Conservation Plan consistent with OAR Chapter 690, Division 86;
- installation of water meters at user sites and established other water conservation programs and activities;
- installation of fish screens; and
- submission of a permit amendment to the Department proposing to add an additional point of appropriation under Permit G-7593.

17. As of May 17, 2007, the City has invested at least $1,686,785, which is 89 percent of the total projected cost for complete development of this project. The City anticipates an additional $200,000 investment is needed for the completion of this project.

18. Since the issuance of Permit G-7593 on December 2, 1977, approximately 0.613 cfs of the

0.647 cfs allowed has been appropriated from the Behrman Well for beneficial municipal purposes under the terms of this permit.

19. The Department has considered the City's compliance with conditions, and did not identify any concerns.

Financial Investment and Cost to Appropriate and Apply Water to a Beneficial Purpose [OAR 690-315-0080(3)(b)]

20. As of May 17, 2007, the City has invested at least $1,686,785, which is 89 percent of the total projected cost for complete development of this project. The City anticipates an additional $200,000 investment is needed for the completion of this project.

The Market and Present Demands for Water [OAR 690-315-0080(3)(d)]

21. As described in Findings 9 through 14 the City has indicated, and the Department finds that the City must rely on full development of all its current ground water rights and surface water rights within the Willamette Basin.

22. According to the City, a relatively recent explosion in growth has pushed the City's water system to capacity, and the City must fully utilize its current water permits and water rights to meet current and projected future demands. The City expects commercial and industrial growth to be similar and proportionate to their residential growth.

23. Given the current water supply situation of the City, as well as current and expected demands, there is a market and present demand for the water to be supplied under Permit G-7593.

24. OAR 690-315-0090(3) requires the Department to place a condition on this extension of time to provide the diversion of water beyond 0.613 cfs under Permit G-7593 shall only be authorized upon issuance of a final order approving a Water Management and Conservation Plan (WMCP) under OAR Chapter 690, Division 86. A "Development Limitation" condition" is specified under Item 1 of the "Conditions" section of this PFO to meet this requirement.

Fair Return Upon Investment [OAR 690-315-0080(3)(e)]

25. Use and income from the permitted water development project would result in reasonable returns upon the investment made in the project to date.

Other Governmental Requirements [OAR 690-315-0080(3)(f)]

26. Delay in the development of this project was caused, in part, by the requirement of a sand filtration plant in response to the Federal Surface Water Treatment Rule, enacted in 1986. The City commissioned a study and built a slow-sand filtration plant, which was completed in 1997, at a cost exceeding $635,000.

Events which Delayed Development under the Permit [OAR 690-315-0080(3)(g)

27. Unforeseen events extending the length of time needed to fully develop and perfect Permit G-7593 are as follows:

- The Behrman well performed below original specifications with a lower than expected yield.
- The City's limited financial resources have been used to maintain and upgrade the existing water system. These repairs ensured the quality of drinking water and reduced leakage.
- Severe weather in 1996, which included flooding and mudslides, damaged the City's water intake structure.
- As a result of meeting the Federal Surface Water Treatment Rule, the City was required to build a slow sand filtration plant. The construction of the plant was completed in 1997.
- The City purchased "Kelly Field" in order to reduce the risk of contamination of the water supply as a result of private logging activities within the watershed.
- Rebuilding the damaged intake structure, building a slow sand filtration plant and the purchase of "Kelly Field" caused financial limitations on the City, further delaying development of Permit G-7593.

Maintaining the Persistence of Listed Fish Species [OAR 690-315-0080(1)(f) and (2)]

The Department's determination regarding maintaining the persistence of listed fish species shall be based on existing data and advice of the Oregon Department of Fish and Wildlife (ODFW). The determination shall be limited to impacts related to stream flow as a result of use of the undeveloped portion of the permit and further limited to where, as a result of use of the undeveloped portion of the permit, ODFW indicates that stream flow would be a limiting factor for the subject listed fish species.

28. On June 5, 2007, the Water Resources Department determined under OAR Chapter 690 Division 9, that use of water under this ground water Permit G-7593 does not have the potential for substantial interference with surface water.

29. Based upon the Department's determination described in Finding 28, the use of the undeveloped portion of Permit G-7593 does not have the potential for substantial interference with surface water, and therefore the persistence of listed fish species will be maintained.

CONCLUSIONS OF LAW

1. The City is entitled to apply for an extension of time to complete construction and/or completely apply water to the full beneficial use pursuant to ORS 537.630(2).

2. The City has submitted a complete extension application form and the fee specified under ORS 536.050(1)(k), as required by OAR 690-315-0080(1)(a).

3. Pursuant to Section 5, Chapter 410, Oregon Laws 2005, the permit holder is not required to demonstrate that actual construction of the project began within one year of the date of issuance of the permit, as otherwise required by OAR 690-315-0080(1)(b).

4. The time requested to complete construction and apply water to full beneficial use is reasonable, as required by OAR 690-315-0080(1)(c).

5. Completion of construction and full application of water to beneficial use can be completed by October 1, 2017[6] pursuant to OAR 690-315-0080(1)(d).

6. The Department has considered the reasonable diligence and good faith of the appropriator, the cost to appropriate and apply water to a beneficial purpose, the market and present demands for water to be supplied, the financial investment made and the fair return upon the investment, the requirements of other governmental agencies, and unforeseen events over which the water right permit holder had no control, and the Department has determined that the City has shown good cause for an extension of time to complete construction of the water system and to apply the water to full beneficial use pursuant to OAR 690-315-0080(1)(e).

7. As required by OAR 690-315-0090(3) and as described in Finding 24 above and specified under Item 1 of the "Conditions" section of this PFO, the diversion of water beyond 0.613 cfs under Permit G-7593 shall only be authorized upon issuance of a final order approving a Water Management and Conservation Plan under OAR Chapter 690, Division 86.

8. In accordance with OAR 690-315-0080(1)(f), and as described in Findings 28 and 29 above, the persistence of listed fish species will be maintained in the portions of the waterways affected by water use under this municipal use permit.

Proposed Order

Based upon the foregoing Findings of Fact and Conclusions of Law, the Department proposes to issue an order to:

Extend the time for complete construction of the water system under Permit G-7593 from October 1, 1979, to October 1, 2017; and

Extend the time for complete application of water to beneficial use under Permit G-7593 from October 1, 1980, to October 1, 2017.

DATED: September 11, 2007

Dwight French
Administrator
Water Rights and Adjudications Division

If you have any questions, please check the information box on the last page for the appropriate names and phone numbers.

Proposed Final Order Hearing Rights

1. Under the provisions of OAR 690-315-0100(1) and 690-315-0060, the applicant or any

---

[6] For permits applied for or received on or before July 9, 1987, upon complete development of the permit, you must notify the Department that the work has been completed and either: (1) hire a water right examiner certified under ORS 537.798 to conduct a survey, the original to be submitted as required by the Department, for issuance of a water right certificate; or (2) continue to appropriate water under the water right permit until the Department conducts a survey and issues a water right certificate under ORS 537.625.

other person adversely affected or aggrieved by the proposed final order may protest and request a contested case hearing on the proposed final order. Your request for contested case hearing must be in writing and must be received by the Water Resources Department no later than **October 26, 2007** being 45 days from the date of publication of the proposed final order in the Department's weekly public notice.

2. A written request for contested case hearing shall include:
   a. The name, address and telephone number of the petitioner;
   b. A description of the petitioner's interest in the proposed final order and if the protestant claims to represent the public interest, a precise statement of the public interest represented;
   c. A detailed description of how the action proposed in the proposed final order would adversely affect or aggrieve the petitioner's interest;
   d. A detailed description of how the final order is in error or deficient and how to correct the alleged error or deficiency;
   e. Any citation of legal authority supporting the petitioner, if known;
   f. Proof of service of the protest upon the water right permit holder, if petitioner is other than the water right permit holder; and
   g. The protest fee required under ORS 536.050, if petitioner is other than the water right permit holder.

3. Within 60 days after the close of the period for requesting a contested case hearing, the Director shall:
   a. Issue a final order on the extension request; or
   b. Schedule a contested case hearing if a request for contested case hearing has been submitted, and:
      1) Upon review of the issues, the Director finds there are significant disputes related to the proposed agency action; or
      2) The applicant submits a written request for a contested case hearing within 30 days after the close of the period for submitting protests.

- If you have any questions about statements contained in this document, please contact Ann L. Reece at 503-986-0827.
- If you have questions about how to file a protest or if you have previously filed a protest and you want to know the status, please contact Dwight French at 503-986-0819.
- If you have any questions about the Department or any of its programs, please contact our Water Resources Customer Service Group at 503-986-0801.
- Address any correspondence to: Water Rights and Adjudications Division

  725 Summer St NE, Suite A
- Fax: 503-986-0901 Salem, OR 97301-1266

BEFORE THE WATER RESOURCES DEPARTMENT
OF THE
STATE OF OREGON

In the Matter of the Proposed Water Management and Conservation Plan for City of Banks, Washington County	)))	FINAL ORDER APPROVING A WATER MANAGEMENT AND CONSERVATION PLAN

Authority

OAR Chapter 690, Division 086, establishes the process and criteria for approving water management and conservation plans required under the conditions of permits, permit extensions and other orders of the Department. An approved water management plan may authorize the diversion and use of water under a permit extended pursuant to OAR Chapter 690, Division 315.

Background

On April 17, 2009, the City of Banks submitted a draft Water Management and Conservation Plan for review under OAR Chapter 690, Division 086 (November 2002). Submittal of the plan was required under the Final Order approving an Extension of Time for Permit G-7593.

The Department published notice of receipt of the plan on April 21, 2009, as required under OAR Chapter 690, Division 086. No public comments were received.

The Department provided comments on the plan to the City on August 21, 2009, and, in response, the City submitted supplemental information revising the plan on June 28 and July 15, 2010.

Findings of Fact

1. The City of Banks Water Management and Conservation Plan contains all of the plan elements required under OAR 690-086-0125.

2. The projections of future water needs in the plan demonstrate a need for over 0.67 cfs of water available under Permit G-7593 to meet demands for the population anticipated in 20 years. These projections are reasonable and consistent with the City's land use plan.

3. The plan includes 5-year benchmarks for installation and maintenance of new water audit software, implementation of an annual water audit and a meter replacement program, as well as the continuation of customer meter testing, leak detection surveys and the semi-annual inclusion of educational messages and water conservation tips on water bills. The system is fully metered and the rate structure includes a base rate and volumetric charge. Unaccounted-for water is estimated at 29.5 percent.

4. The plan includes 5-year benchmarks for the evaluation, development, and implementation of a program to regularly test the City's supply meters.

This final order is subject to judicial review by the Court of Appeals under ORS 183.482. Any petition for judicial review must be filed within the 60-day time period specified by ORS 183.482(1). Pursuant to ORS 536.075 and OAR 137-003-0675, you may petition for judicial review or petition the Director for reconsideration of this order. A petition for reconsideration may be granted or denied by the Director, and if no action is taken within 60 days following the date the petition was filed, the petition shall be deemed denied.

5. The plan identifies unnamed surface water springs and streams in the West Fork Dairy Creek subbasin and ground water (all within the Tualatin River Basin) as the sources of the City's water rights. The plan also accurately and completely describes the federally listed Upper Willamette River Steelhead and Chinook Salmon as threatened species, and identifies water quality issues in Dairy Creek, the Tualatin River and the Willamette River downstream of the City's source water.

6. The water curtailment element included in the plan satisfactorily promotes water curtailment practices and includes a list of three stages of alert with concurrent curtailment actions.

7. The diversion of water under permit G-7593 will be expanded during the next 20 years and is consistent with OAR 690-086-0130(7), as follows:

   a. As evidenced by the 5-year benchmarks described in Findings of Fact #3 and #4, the plan includes a schedule for development of conservation measures that would provide water at a cost that is equal to or lower than the cost of other identified sources;

   b. Considering fiscal limitations that, at this time, make it impractical for the City to install infrastructure necessary to purchase and convey additional water from other entities and considering limitations in the City's available supply from their surface water sources due to high turbidity levels in the winter and limited summer flow rates, increased use from the City's ground water source is the most feasible and appropriate water supply alternative to the supplier; and

   c. The City is not required to provide mitigation to address limitations or restrictions on the development of their ground water permits, as no resource issues pertaining to those permits have been identified under OAR 690-086-0140(5)(i).

Conclusion of Law

The water management and conservation plan submitted by the City of Banks is consistent with the criteria in OAR Chapter 690, Division 086.

Now, therefore, it is ORDERED:

1. The City of Banks Water Management and Conservation Plan is approved and shall remain in effect until August 9, 2020, unless this approval is rescinded pursuant to OAR 690-086-0920.

2. The limitation of the diversion of water under Permit G-7593 established by the Extension of Time approved on November 20, 2008, is removed and, subject to other limitations or conditions of the permit, the City of Banks is authorized to divert up to 0.67 cfs under Permit G-7593.

3. The City of Banks shall submit an updated plan within 10 years and no later than August 9, 2020.

4. The City of Banks shall submit a progress report containing the information required under OAR 690-086-0120(4) by August 9, 2015.

Dated at Salem, Oregon this 10 day of August, 2010.

Phillip C. Ward, Director

Mailing date: AUG 11 2010

Application No. G-8476 Permit No. G 7593

Permit to Appropriate the Public Waters of the State of Oregon

This is to certify that I have examined the foregoing application and do hereby grant the same, SUBJECT TO EXISTING RIGHTS INCLUDING THE EXISTING MINIMUM FLOW POLICIES ESTABLISHED BY THE WATER POLICY REVIEW BOARD and the following limitations and conditions:

The right herein granted is limited to the amount of water which can be applied to beneficial use and shall not exceed 0.67 *cubic feet per second measured at the point of diversion from the well or source of appropriation, or its equivalent in case of rotation with other water users, from* a well

The use to which this water is to be applied is municipal.

If for irrigation, this appropriation shall be limited to ..... *of one cubic foot per second or its equivalent for each acre irrigated and shall be further limited to a diversion of not to exceed* ..... *acre feet per acre for each acre irrigated during the irrigation season of each year;*

and shall be subject to such reasonable rotation system as may be ordered by the proper state officer.

The well shall be constructed in accordance with the General Standards for the Construction and Maintenance of Water Wells in Oregon.

The works constructed shall include an air line and pressure gauge or an access port for measuring line, adequate to determine water level elevation in the well at all times.

The permittee shall install and maintain a weir, meter, or other suitable measuring device, and shall keep a complete record of the amount of ground water withdrawn.

The priority date of this permit is September 29, 1977

Actual construction work shall begin on or before December 2, 1978 *and shall thereafter be prosecuted with reasonable diligence and be completed on or before October 1, 19*79

*Complete application of the water to the proposed use shall be made on or before October 1, 19*80

WITNESS my hand this 2nd *day of* December, *19*77

James E. Sexson

Water Resources Director

Application No. G-8476 Permit No. G 7593

STATE OF OREGON WATER RESOURCES DEPARTMENT

Application for a Permit to Appropriate Ground Water

RECEIVED
SEP 20 1977
WATER RESOURCES DEPT
SALEM, OREGON

I, City of Banks, Oregon (Name of Applicant)

of City Hall (Mailing Address), Banks (City)

State of Oregon, 97106 (Zip Code) Phone No. Mayor Howard Steinbach 324-2251 do hereby
Robert Prickett, City Recorder 324-8462

make application for a permit to appropriate the following described ground waters of the State of Oregon:

1. The development will consist of one well (Give number of wells, tile lines, infiltration galleries, etc.)

having a diameter of 8 inches and an estimated depth of 450 feet.

2. The well or other source is to be located 135 ft. S (N. or S.) and 560 ft. W (E. or W.)

from the ¼ corner of X on the north line of Section 31, T2N, R3W, W.M. (Public Land Survey Corner)

(If there is more than one well, each must be described)

being within the NE ¼ of the NW ¼ of

Sec. 31 Tp. 2N R. 3W, W. M., in the county of Washington

3. Location of area to be irrigated, or place of use if use other than irrigation.

Township	Range	Section	List ¼ ¼ of Section	List use and/or number of acres to be irrigated
SEE ATTACHED	SHEET #1			

4. It is estimated that 210 feet of the well will require 8 5/8" diameter welded steel (Kind) casing.

5. Depth to water table is estimated (Feet) Well drilled by A.M. Jannsen Drilling Co. Aloha, Oregon

Form 690-3-0-1-77

6. *The amount of water which the applicant intends to apply to beneficial use is* ..... *cubic feet per second or* ....300..... *gallons per minute.*

7. *The use to which the water is to be applied is* ..municipal.....

.....

8. *If the flow to be utilized is artesian, the works to be used for the control and conservation of the supply when not in use must be described.*

(not artesian)

9. *If the location of the well, or other development work is less than one-fourth mile from a natural stream channel, give the distance to the channel and the difference in elevation between the stream bed and the ground surface at the source of development.*

Natural stream channel (intermittent flow) 130 feet due east of well. Well is 10 feet higher than streambed.

10. *DESCRIPTION OF WORKS*

Include length and dimensions of supply ditch or pipeline, size and type of pump and motor, type of irrigation system to adequately describe the proposed distribution system.

Water will be conveyed from well to existing city reservoir (as shown on attached map) through an 8-inch pipeline.

The proposed well pump will be a 40 H.P., 14 stage deep well turbine capable of delivering 300 gallons per minute to a 400 ft. T.D.H.

11. *Construction work will begin on or before* Well construction - August 16, 1977; Pump & pipeline - January, 1978

12. *Construction work will be completed on or before* Well construction - August 24, 1977; Pump & pipeline - June, 1978

13. *The water will be completely applied to the proposed use on or before* July, 1978

14. *If the ground water supply is supplemental to an existing supply, identify the supply and existing water right.* See attached map showing existing water supply system. Water right certificate no. 5353.

Application No. G-8476 *Permit No.* G 7593

SHEET #1

3. Location of area to be irrigated, or place of use if use other than irrigation.

Township	Range	Section	List ¼ ¼ of Section
T2N	R3W	29	SW¼ SW¼
T2N	R3W	30	NW¼ SW¼
			SW¼ SW¼
			SE¼ SW¼
			SW¼ SE¼
			SE¼ SE¼
T2N	R3W	31	NW¼ NW¼
			NE¼ NW¼
			NW¼ NE¼
			NE¼ NE¼
			SE¼ NE¼
			SE¼ NW¼
			SW¼ NW¼
			NW¼ SW¼
			SW¼ SW¼
T2N	R3W	32	NW¼ NW¼
			SW¼ NW¼
T2N	R4W	25	NE¼ SE¼
			SE¼ SE¼
			SW¼ SE¼
T2N	R4W	36	NW¼ NE¼
			NE¼ NE¼
			SE¼ NE¼
			NE¼ SE¼
			SE¼ SE¼

Application No. G-8176
Permit No. G 7593

SHEET #2

REMARKS:

The City of Banks presently obtains it's water supply from springs about 4 miles north of the City (see Water Right Certificate No. 5353 and attached map). The present supply is not sufficient to meet summer-time needs; therefore a new well was constructed. At present, Banks supplys water to 747 persons and in year 2000 it is estimated that 1,971 persons will be served. Average day water requirements are presently 104,500 G.P.D. and in year 2000 it is estimated to be 276,000 G.P.D.

Requirements of the average day of the maximum month are presently 200,000 G.P.D. and in year 2000 it is estimated to be 524,000 G.P.D. The present supply (springs) can provide 173,000 G.P.D. and the proposed well can supply 432,000 G.P.D. for a total of 605,000 G.P.D. which will meet the estimated needs in year 2000.

Application No. 6-8476
Permit No.

Remarks: SEE ATTACHED SHEET #2

Howard D. Steinbock Mayor
Signature of Applicant
City of Banks, Banks Or.

This is to certify that I have examined the foregoing application, together with the accompanying maps and data, and return the same for

In order to retain its priority, this application must be returned to the Water Resources Director with corrections on or before , 19

WITNESS my hand this day of , 19

Water Resources Director

By

This instrument was first received in the office of the Water Resources Director at Salem, Oregon, on the 29TH day of SEPTEMBER, 19 77, at 8:00 o'clock A.M.

Application No. G-8476 *Permit No.* G 7593

Mailing List for Extension FO Copies

Note: Include a copy of the "Important Notice" document along with the original copy of the Final Order being sent to the permit holder.

FO Date: November 20, 2008

Application G-8476
Permit G-7593

Copies Mailed
By: _____ (SUPPORT STAFF)
on: 11/20/08 (DATE)

Original mailed to permit holder:

City of Banks
Attn: Mayor Teri Branstitre
100 S. Main Street
Banks, OR 97106

Copies sent to:

1. WRD - App. File G-8476 / Permit G-7593
2. WRD - Watermaster District 18, Darrell Hedin
3. WRD – Sarah Henderson, Technical Services *(for MU requiring Division 86 plan)*
4. Colm Moore, Attorney, Schroeder Law Offices, P.C., 1915 NE 39th Avenue, Portland, OR 97212
5. WRD - Support Staff, Salem...*Permit record update*

Fee paid as specified under ORS 536.050 to receive copy:

6. None

Receiving via e-mail (10 AM day of signature date)

7. None

CASEWORKER: ALR

Mailing List for Extension PFO Copies

PFO Date: August 10, 2007

Application G-8476
Permit G-7593

Original mailed to Applicant:

City of Banks
Attn: Mayor Teri Branstitre
100 S. Main Street
Banks, OR 97106

Copies Mailed

By: DS
(SUPPORT STAFF)
9/11/07

Copies sent to:

1. WRD - Appl. File G- 8476 / Permit G-7593

2. WRD - Watermaster District 18 – Darrell Hedin

Other interested parties:

5. Colm Moore, Attorney, Schroeder Law Offices, P.C., 1915 NE 39th Avenue, Portland, OR 97212

Fee paid as specified under ORS 536.050 to receive copy:

6. None

Receiving via e-mail (10 AM Tuesday of signature date)

9. Notification only: WRD – Salem Opeifa and Gerry Clark (if Reimbursement Authority)
*Done by*_____ *Date*_____

CASEWORKER: ALR

WATER RESOURCES DEP
REIMBURSEMENT AUTHORITY EST

House Bill 2551 (2003 Oregon Laws) authorizes the Oregon Water Res
regulatory processes voluntarily requested under the agreement. The
any person requesting services and agreeing to pay the Department's c

The Department has established a pool of qualified contractors to perfo
water right permits extensions, and water right certificates.

PLEASE COPY + SEND TO:
NEWTON CONSULTANTS
521 SW 6TH ST, STE 100
REDMOND, OR 97756
FOR REIMBURSEMENT AUTHORITY
Thanks,
Kim

The purpose of this application is to obtain an estimate from the next
is a non-refundable application fee of $125.00 per request. The contr
the time required to process and develop a recommendation on the req

REQUEST	TYPE	
☐	Transfer Application	
☐	Certificate Request	
☒	Extension of Time Request	67593

	Applicant Information	Applicant's Representative/Contact
Name: (Please Print)	City of Banks	Jolynn Becker
Address:	100 S Main St	"
	Banks OR 97106	"
Phone:	503-324-5112	"
Fax	503-324-6674	"
E-Mail Address:		recorder@cityofbanks.org

I understand the following:

- There is a non-refundable application fee of $125.00 per request.
- That upon receipt of my non-refundable application fee in the amount of $ 125.00, OWRD will assign my request to the next contractor in the pool of contractors performing expedited services.
- That this fee covers the copying, the mailing cost, as well as the cost for the contractor to evaluate and provide the estimate for processing of the request.
- That OWRD will provide all pertinent information to the assigned contractor within three (3) business days.
- That OWRD will, within fourteen (14) days, notify me in writing of the estimates of costs and time frame for the expedited service.
- That upon receiving the estimates I may agree or decline to enter into a formal contract to pay the estimated cost in advance to initiate the expedited service.
- An incomplete or inaccurate application may delay the process and increase the cost to process my request.
- Expedited processing does not guarantee a favorable review of my request.
- Send completed Application and payment to: **OWRD – Reimbursement Authority Program**
  725 Summer St. NE, Suite A
  Salem, OR 97301-1266.

I certify that I am the *(check one)* ☐ Applicant ☒ Applicant's Representative ☐ Other *(Please specify)*_____

Signature: [signature] Name: Teri Branstitre

OWRD USE ONLY

Contractor Assigned: Newton	Total Amount Paid: $ 125
OWRD Approval:	

Revised 4/1/2004

RECEIVED
MAY 17 2007
WATER RESOURCES DEPT
SALEM, OREGON

144 Copies

WATER RESOURCES DEPARTMENT
REIMBURSEMENT AUTHORITY ESTIMATE APPLICATION

House Bill 2551 (2003 Oregon Laws) authorizes the Oregon Water Resources Department to expedite or enhance regulatory processes voluntarily requested under the agreement. The voluntary agreement can be entered into with any person requesting services and agreeing to pay the Department's costs of providing the service.

The Department has established a pool of qualified contractors to perform expedited services for water right transfers, water right permits extensions, and water right certificates.

The purpose of this application is to obtain an estimate from the next qualified contractor in the appropriate pool. There is a non-refundable application fee of $125.00 per request. The contractor will provide an estimate of the cost and of the time required to process and develop a recommendation on the request of a: *(check one)*:

REQUEST	TYPE	FILE NUMBER
☐	Transfer Application	
☐	Certificate Request	
☒	Extension of Time Request	67593

	Applicant Information	Applicant's Representative/Contact
Name: (Please Print)	City of Banks	Jolynn Becker
Address:	100 S Main St	"
	Banks OR 97106	"
Phone:	503-324-5112	"
Fax	503-324-6674	"
E-Mail Address:		recorder@cityofbanks.org

I understand the following:

- There is a non-refundable application fee of $125.00 per request.
- That upon receipt of my non-refundable application fee in the amount of **$ 125.00**, OWRD will assign my request to the next contractor in the pool of contractors performing expedited services.
- That this fee covers the copying, the mailing cost, as well as the cost for the contractor to evaluate and provide the estimate for processing of the request.
- That OWRD will provide all pertinent information to the assigned contractor within three (3) business days.
- That OWRD will, within fourteen (14) days, notify me in writing of the estimates of costs and time frame for the expedited service.
- That upon receiving the estimates I may agree or decline to enter into a formal contract to pay the estimated cost in advance to initiate the expedited service.
- An incomplete or inaccurate application may delay the process and increase the cost to process my request.
- Expedited processing does not guarantee a favorable review of my request.
- Send completed Application and payment to: **OWRD – Reimbursement Authority Program**
  725 Summer St. NE, Suite A
  Salem, OR 97301-1266.

I certify that I am the *(check one)* ☐ Applicant ☒ Applicant's Representative ☐ Other *(Please specify)*_____

Signature: T Branstitre Name: Teri Branstitre

OWRD USE ONLY

Contractor Assigned: Newton	Total Amount Paid: $ 125
OWRD Approval:	

144 Copies $5.50

RECEIVED
MAY 17 2007
WATER RESOURCES DEPT
SALEM, OREGON

Municipal or Quasi-Municipal

Extension PFO Checklist for Water Use Permits

issued on or prior to November 2, 1998

(OAR 690-315-0010 through OAR 690-315-0060)

Application: G - 8476 Permit: G - 7593

Permittee's Name: CITY OF BANKS

Permittee's Mailing Address: 100 MAIN ST, BANKS, OR 97106

POD Location: Township 2N Range 3W Section 31 ¼¼ NENW

Drainage Basin: 2 - WILLAMETTE County: WASHINGTON Watermaster District: 18

Date Permit was issued: 12-2-77 **Priority Date:** 9-29-77 **Date of PN:** _____

Source: A WELL

Use: MUNICIPAL

"Q": 0.~~67~~ 67 CFS

Orig "A" Date: 12-2-78 **Orig "B" Date:** 10-1-79 **Orig "C" Date:** 10-1-80

Extension request received: 5-17-07 **Last Authorized "B" Date:** — **Last Authorized "C" Date:** —

Request Number (...1st 2nd, 3rd): 1ST **Proposed "B" Date:** 10-1-2017 **Proposed C Date:** 10-1-2017

Conditions of Permit:

Condition Met?	Condition Not Met?	Permit Condition
X		INSTALL METER
X		FISH SCREEN

Factors to consider in determining "Reasonable Diligence" [OAR 690-315-0040(3)]:

Yes No

- ☐ ☐ Construction was completed within the time allowed in the permit or previous extension
- ☐ ☐ Beneficial use made of the water during the permit or previous extension time limits
  - Permit holder has beneficially used _____ cfs/gpm/af of the total permitted quantity of water on _____ acres
- ☐ ☐ Water right permit holder conformed with the permit or previous extension conditions; and
- ☐ ☐ Financial investments were made toward developing the beneficial water use.
  - Permit holder has invested approximately _____% of the total estimated cost to complete the project.
  - Amount Invested to date: $_____ Estimated Remaining Cost: $_____

Has the applicant pursued perfection of the right in good faith and with reasonable diligence? Yes ☐ No ☐

Application ___ - _____ Permit ___ - _____ Township _____ Range _____ Section _____

For MUNICIPAL permit ONLY. Maintaining persistence of state or federal listed fish species:

Yes No

- ☐ ☐ Is this a Municipal use Permit? (If **YES**, proceed. If **NO**, skip to "Good Cause")
- ☐ ☐ Was this permit issued on or prior to 11/2/98? (If **NO**… **STOP**. You are using the wrong form. Use *PFO Checklist MU/QM for permits issued after 1/2/98.*
- ☐ ☐ Is this the first extension issued since 6/29/05 (*effective date of HB 3038*)? (If **NO**…**STOP**. Indicate N/A and skip to "Good Cause" *[refer to OAR 690-315-0080(1)(f)]*
- ☐ ☐ If YES to above items, has ODFW reviewed extension application?
- ☐ ☐ Has ODFW recommended adding any conditions to the Extension PFO?
- ☐ ☐ Does the permit holder have any existing fish protection agreement with a state or federal agency? *(Refer to ODFW's review for this determination* _____*)*

Based on the written record, can the Department make a finding of "Good Cause" to approve the extension request?

Yes... "Good Cause" can be found. ☐ Approval of Extension Request

No ... "Good Cause" *cannot* be found. ☐ Denial of Extension Request

Conditions to be included in Extension PFO (if applicable)? Yes ☐ No ☐

***(NOTE:** Check the file record for documentation to add a condition(s) at the extension stage.)*

☐ Max "Q" Development Limitations and Div. 856 Water Management and Conservation Plan

☐ Other: _____

Footnote regarding Claim of Beneficial Use. Choose the appropriate language below and insert as a footnote in the PFO:

☐ **COBU Requirement - Surface/Ground Water - on or prior to July 9, 1987**

"For permits applied for or received on or before July 9, 1987, upon complete development of the permit, you must notify the Department that the work has been completed and either: (1) Hire a water right examiner certified under ORS 537.798 to conduct a survey, the original to be submitted as required by the Water Resources Department, for issuance of a water right certificate; or (2) Continue to appropriate water under the water right permit until the Water Resources Department conducts a survey and issues a water right certificate under ORS 537.250 or 537.625."

☐ **COBU Requirement - Surface Water - post July 9, 1987**

"Pursuant to ORS 537.230(3), upon the completion of beneficial use of water allowed under the permit, the permittee shall hire a certified water rights examiner to survey the appropriation. Within one year after the complete application of water to a beneficial use (or by the date allowed for the complete application of water to a beneficial use), the permittee shall submit a map of the survey and the claim of beneficial use."

☐ **COBU Requirement - Ground Water - post July 9, 1987**

"Pursuant to ORS 537.630(3), upon the completion of beneficial use of water allowed under the permit, the permittee shall hire a certified water rights examiner to survey the appropriation. Within one year after the complete application of water to a beneficial use (or by the date allowed for the complete application of water to a beneficial use), the permittee shall submit a map of the survey and the claim of beneficial use."

NOTES:

Extension "PFO" Dates

Mailing / Issuance Date: _____ **Protest Deadline Date:** _____

Reviewer's Name: _____ **Date:** _____

Application # G-8476 **Permit #** G-7593

Public Notice Route Slip ... New Application Extension of Time

per Division 315 Rules... (Extensions received on July 1, 2001 or after)

- **WRIG...**
  Money Receipted on: 5/17/07
- **Ann Reece...**
  - ☑ Extension Application is Complete
    (If NOT complete, send certified letter requesting add'l information.)
  - ☑ Added to tracking spreadsheet

If Extension Appl complete and $250 fee submitted, route to...

- **Jonnine Skaug...**
  - ☒ Publish on Public Notice (initial 30-day comment): Date of notice 5/22/07 JS
    Update "cdatewext.DB" Database:
  - ☒ In the "PNotice Date" field... Enter the date the Extension Application was published on the Public Notice.
  - ☑ In the "Ext Filed" field... Enter the date the Extension Application was received.

S:\groups\wr\extensions\Forms and Templates\Routing Slips\route slip_per div 315 rules_public notice.dot

15315

SCHROEDER LAW OFFICES, P.C.

58.00 Oregon Water Resources Department Salem			
05/09/07	Application for time extension App G-8476, Permit G-7593	250.00	250.00

05/09/07	15315	Gross:	250.00	Ded:	0.00	Net:	250.00

STATE OF OREGON

WATER RESOURCES DEPARTMENT

RECEIPT # 87626

725 Summer St. N.E. Ste. A
SALEM, OR 97301-4172
(503) 986-0900 / (503) 986-0904 (fax)

INVOICE # _____

RECEIVED FROM: Schroeder Law Offices PC

BY: _____

APPLICATION	G-8476
PERMIT	G-7593
TRANSFER	

CASH: ☐ CHECK:# ☒ 15315 OTHER: (IDENTIFY) ☐ _____

TOTAL REC'D $ 250.00

1083 TREASURY 4170 WRD MISC CASH ACCT

0407	COPIES		$
_____	OTHER:	(IDENTIFY) _____	$

0243 I/S Lease _____ 0244 Muni Water Mgmt. Plan _____ 0245 Cons. Water _____

4270 WRD OPERATING ACCT

MISCELLANEOUS PCA-46111

0407	COPY & TAPE FEES		$
0410	RESEARCH FEES		$
0408	MISC REVENUE: (IDENTIFY)	_____	$
TC162	DEPOSIT LIAB. (IDENTIFY)	_____	$
0240	EXTENSION OF TIME		$ 250.00

WATER RIGHTS:

		EXAM FEE		RECORD FEE
0201	SURFACE WATER	$	0202	$
0203	GROUND WATER	$	0204	$
0205	TRANSFER	$		

WELL CONSTRUCTION

		EXAM FEE		LICENSE FEE
0218	WELL DRILL CONSTRUCTOR	$	0219	$
	LANDOWNER'S PERMIT		0220	$

_____ OTHER (IDENTIFY) _____

0536 TREASURY 0437 WELL CONST. START FEE

0211	WELL CONST START FEE	$	CARD #	
0210	MONITORING WELLS	$	CARD #	

_____ OTHER (IDENTIFY) _____

0607 TREASURY 0467 HYDRO ACTIVITY

		LIC NUMBER	
0233	POWER LICENSE FEE (FW/WRD)		$
0231	HYDRO LICENSE FEE (FW/WRD)		$
_____	HYDRO APPLICATION		$

____ TREASURY OTHER / RDX

FUND _____ TITLE _____

OBJ. CODE _____ VENDOR # _____

DESCRIPTION _____ $

RECEIPT: 87626 DATED: 5/17/07 BY: _____

Distribution – White Copy - Customer, Yellow Copy - Fiscal, Blue Copy - File, Buff Copy - Fiscal

Laura A. Schroeder
Licensed in Oregon, Idaho, Nevada and Washington

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Licensed in Oregon

May 16, 2007

VIA US MAIL

Oregon Water Resources Department
725 Summer Street N.E. Suite A
Salem, OR 97301-4172
Attn: Water Right Permit Extensions/Kim French

RE: Application for Extension of Time for Municipal and Quasi-Municipal Water Use Permits, Application G-8476, Permit G-7593

Dear Ms. French:

Enclosed please find the City of Banks' Application for Extension of Time for Municipal and Quasi-Municipal Water Use Permits for Application G-8476, Permit G-7593, with Exhibits A – K attached. In addition, we have included the City of Banks' Reimbursement Authority Estimate Application. We have enclosed our firm check in the amount of $250.00 for the extension application, and a separate check in the amount of $125.00 for the reimbursement authority request.

If you have any questions regarding this application, please contact attorney Colm Moore or paralegal Tara Jackson of this office at (503) 281-4100.

Very truly yours,
SCHROEDER LAW OFFICES, P.C.

Brooke A. Carlock

Brooke A. Carlock
Paralegal

KCT:dnc
Enclosures

cc: Client

RECEIVED
MAY 17 2007
WATER RESOURCES DEPT
SALEM, OREGON

phone 503-281-4100 fax 503-281-4600
1915 NE 39th Avenue, P.O. Box 12527, Portland, Oregon 97212-0527
www.water-law.com

Application # G-8476 / **Permit #** G-7593

Permit Holder: CITY OF BANKS

Drainage Basin: WILLAMETTE #2 *Watermaster Name and #:* 18 - DARREN HEDIN

Place a (✓) in the box if the item is satisfied	**Division 315 - Municipal/Quasi-Municipal Extension of Time - Completeness Checklist OAR 690-315-0070(3)**
✓	*1. [OAR 690-315-0070(3)]* The appropriate extension of time fee (as specified in ORS 536.050). **$100** - applications received by September 30, 2003 / **($250)** - applications received on or after October 1, 2003 Duplicate Fees Paid? _____
✓	* *[OAR 690-315-0070(3)(a)]* The name and mailing address of the water right permit holder(s);
✓	* *[OAR 690-315-0070(3)(b)]* The application number and the permit number for which an extension is requested;
N/A	*2-A. [OAR 690-315-0070(3)(c)]* For ***Quasi-Municipal*** water use permit holders, evidence of the actions taken to begin actual construction on the project, as defined in 690-315-0020(3)(d), if required under the applicable statute; • "Actual construction" means physical work performed toward completion of the water system, which demonstrates both the present good faith of the water right permit holder and the water right permit holder's intention to complete the project with reasonable diligence; • "Actual construction" does not include planning a diversion system, formulating a business plan, securing financing, letting contracts, purchasing but not installing equipment, or surveying. Date permit issued: ~~12-2-77~~ *(NOTE: Municipal and Quasi-Municipal permits issued after 11/2/98 are also subject to review under 690-315-0080(5)... See PFO Checklist)* "A" date: _____ "B" date: _____ "C" date: _____ "A" Date Met? **YES** or **NO**
✓	*2-B. [OAR 690-315-0070(3)(d)]* - For ***Municipal*** water use permits issued on or after June 29, 2005, evidence of the actions taken to begin actual construction on the project, as defined in 690-315-0020(3)(d); • "Actual construction" means physical work performed toward completion of the water system, which demonstrates both the present good faith of the water right permit holder and the water right permit holder's intention to complete the project with reasonable diligence; • "Actual construction" does not include planning a diversion system, formulating a business plan, securing financing, letting contracts, purchasing but not installing equipment, or surveying. Date permit issued: 12-2-77 *(NOTE: Municipal and Quasi-Municipal permits issued after 11/2/98 are also subject to review under 690-315-0080(5)... See PFO Checklist)* "A" date: 12-2-78 "B" date: 10-1-79 "C" date: 10-1-80 "A" Date Met? **(YES)** or **NO**
✓	*3. [OAR 690-315-0070(3)(e)]* - This is extension request # 1 Evidence of actions taken to develop the right within the original permitted time period ***OR***, during the most recent extension period from _____ to _____
✓	*4. [OAR 690-315-0070(3)(f)]* Evidence of compliance with conditions contained in the permit and any previous extension(s) or the reason the condition was not satisfied; METER INSTALLED WATER MEASUREMENTS TAKEN
✓	*5. [OAR 690-315-0070(3)(g)]* Evidence of the maximum INSTANTANEOUS rate (or duty if applicable) of diversion for beneficial water use, if any, made to date; 0.613CFS
✓	*6. [OAR 690-315-0070(3)(h)]* An estimate of the population served and a description of the methodology(ies) used to make the estimate; 1876

Place a (✓) in the box if the item is satisfied	**Division 315 - Municipal/Quasi-Municipal Extension of Time - Completeness Checklist OAR 690-315-0070(3)**
✓	*7. [OAR 690-315-0070(3)(i)]* A description of financial expenditures made toward completion of the water development; $1,686,785
✓	*8. [OAR 690-315-0070(3)(j)]* An estimate of the cost to complete the water development; $200,000
✓	*9. [OAR 690-315-0070(3)(k)]* A summary of any events that delayed completion of the water development or application of water to full beneficial use, including other governmental requirements, if any, relating to the project that have significantly delayed completion of construction or perfection of the right;
✓	*10. [OAR 690-315-0070(3)(l)]* **PART A:** An estimated demand projection and a description of the methodology(ies) used for the subject water right permit, considering the other water rights held by the municipal or quasi-municipal water use permit holder, and a date by which the water development is anticipated to be completed and water put to full beneficial use. Current Peak Water Demands: .33MGD Projected Population: 3739 BY 2024 Potential Growth: Inventory of Water Rights Held: EXHIBIT K **PART B:** Extension requests for greater than 50 years must include documentation that the demand projection is consistent with the amount and types of lands and uses proposed to be served by the permit holder.
✓	*11. [OAR 690-315-0070(3)(m)]* A summary of the applicant's plan and schedule to complete construction and/or perfect the water right;
✓	*12. [OAR 690-315-0070(3)(n)]* Justification for the time requested to complete the project and/or apply the water to full beneficial use; PERMIT AMENDMENT
✓	*13. [OAR 690-315-0070(3)(o)]* Any other information the applicant determines is relevant to evaluate the application in accordance with applicable statutes and rules;
✓	* *[OAR 690-315-0070(3)(p)]* Any other information required by the Department that is necessary to evaluate the application in accordance with applicable statutory requirements.
	[OAR 690-315-0070(3)(q)] ***For Municipal water use permits issued on or before November 2, 1998:*** **for the first extension issued after June 29, 2005,** the completed application must include a copy of any agreements regarding the use of the undeveloped portion of the permit between the permit holder and a federal or state agency that include conditions or required actions that maintain the persistence of listed fish species in the portions of waterways affected by water use under the permit.
✓	* Signature(s) of the water right permit holder(s) or authorized agent.

Name of Reviewer: KIM FRENCH **Date:** 5/17/07

Permit G-7593

Water Year	Unit	Oct	Nov	Dec	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep
2004	G	1672500	653300	771100	518200	582000	744000	246600	1503500	3598900	7318800	5308300	2882500
2003	G	3125600	1624300	1894500	1473500	286500	114400	848000	171000	4115700	7180600	5760400	5443200
2002	G	4590600	2138100	1350600	0	0	0	0	379800	3342200	5133600	6787000	4811200
2001	G	4378600	4867400	1832500	1160200	3243200	1916400	2119400	3780200	5126000	6734500	6894700	5617100
1998	C	0	0	0	0	0	0	0	0	355200	6702100	10176862	7040452
1997	C	0	0	0	0	0	0	0	34288	32243	435718	509330	92407
1996	C	337916	377944	361727	344026	634919	383685	362516	339388	430033	747774	734794	483335
1994	C	311307	212747	206693	331333	290453	208293	173400	265453	195453	623866	397267	303480
1993	C	305040	206707	321360	327067	173733	30197	139667	160453	154787	170853	357497	345965
1992	C	159933	162893	220547	98107	190707	78947	112253	219227	332893	414120	354574	181520
1991	C	184040	131066	196947	136733	100493	88080	76107	96293	102160	351960	415773	222093
1990	C	54750	336020	211860	210670	49750	166270	55720	65520	127650	281300	316480	243090
1988	G	0	0	0	3150000	3150000	3150000	3150000	3150000	3150000	3150000	3150000	3150000

Oregon Water Resources Department
725 Summer Street NE, Suite A
Salem Oregon 97301-1266
(503) 986-0900
www.wrd.state.or.us

Application for Extension of Time for Municipal and Quasi-Municipal Water Use Permits

TO THE DIRECTOR OF THE OREGON WATER RESOURCES DEPARTMENT

A separate extension application must be submitted for <u>each</u> permit as per OAR 690-315-0070(2). This page, with an original signature by the permit holder of record, must accompany any application for extension of time.

This application and a summary of review criteria and procedures that are generally applicable to this application are available at http://www.wrd.state.or.us/OWRD/PUBS/forms.shtml

I, City of Banks — Mayor Teri Branstitre
NAME OF PERMIT HOLDER [*OAR 690-315-0070(1) and (3)(a)*] — NAME OF CONTACT

100 S. Main Street — Banks — Oregon — 97106
ADDRESS — CITY — STATE — ZIP

(503) 324-5112
PHONE — E-MAIL ADDRESS

the permit holder of: Application Number G - 8476

Permit Number G - 7593
[*OAR 690-315-0070(3)(b)*]

do hereby request that the time in which to:

☑ complete construction (of diversion/appropriation works and/or purchase and installation of the equipment necessary to the use of water), which time now expires on October 1, 1979, be extended to October 1, 2017,

and/or the time in which to:

☑ apply water to full beneficial use under the terms and conditions of the permit, which time now expires on October 1, 1980, be extended to October 1, 2017.

I am the permittee, or have written authorization from the permittee, to apply for an extension of time under this permit. I certify that the information I have provided in this application is true and correct to the best of my knowledge.

J. Branstitre — 5/8/07
Signature — Date

Last Revised: 01/19/2007 — WRAD

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MAY 17 2007
WATER RESOURCES DEPT
SALEM, OREGON

1. **The appropriate fee, as specified under ORS 536.050.**

   Please find enclosed a check made payable to the Oregon Department of Water Resources for $250, as required by ORS 536.050 to accompany the Application for Extension of Time For Quasi-Municipal and Municipal Water Use Permits.

2. **For Quasi-Municipal water use permits, evidence of the actions taken to begin actual construction on the project, if required under the applicable statute.**

   This item does not apply to the City of Banks.

3. **For Municipal water use permits issued on or after June 29, 2005, evidence of actions taken to begin actual construction on the project.**

   This item does not apply to the City of Banks. The Department issued Permit G-7593 on December 2, 1977. (*Exhibit A*).

4. **Evidence of actions taken to develop the water right permit within the permitted time period and/or time period of the previous extension.**

   As the tables below demonstrate, the City of Banks has expended considerable time and resources developing its water system and employing technical experts to assist in the same. In particular, the City applied for and was granted Permit G-7593 to appropriate water from a well (the "Behrman Well") for municipal use within the City of Banks' service area. The charts below demonstrate the actions and work taken by the City to develop Permit G-7593.

   For reference the following abbreviations are used in the table below:
   WMCP = Water Management and Conservation Plan (*Exhibit B*)
   WSMP = 1995 Water System Master Plan (*Exhibit C*).
   WSMP Update = 1998 Water System Master Plan Update (*Exhibit D*).

Dates	All Work and Actions Accomplished Before Permit was Issued	Cost
8/16/1977	A.M. Jannsen Drilling Co. began drilling the Behrman Well.	Unavailable
8/24/1977	A.M. Jannsen Drilling Co. completed drilling Behrman Well. (*Exhibit E*).	Unavailable
9/29/1977	City of Banks filed Application No. G-8476 for a Permit to Appropriate Ground Water.	$35.00

Dates	All Work and Actions Accomplished During Permitted Time Period	Cost
12/2/1977	The permit was signed.	NA
12/2/1978	The permit specified "Actual Construction Work" shall begin "(A-Date") on or before 12/2/1978.	NA

1979	City of Banks completed development of Behrman Well, including construction of well house and piping assembly. (WMCP 3-5)	$48,000.00 (estimated)
10/1/1979	The permit specified that actual construction work shall be completed on or before 10/1/1979.	NA
10/1/1980	The permit specified complete applications of water to the use shall be made ("C-Date") by 10/1/1980.	NA
12/4/1980	City of Banks filed Form C indicating: "Water was used beginning June 13th, 1980 to furnish water for the State of Oregon for ash removal – Online and operating fully October 1st, 1980." (*Exhibit F*).	NA
12/11/1980	City of Banks filed Form B indicating that completion of construction occurred by October 30th, 1979.	NA

Dates	**All Work and Actions Accomplished After Permit "C-Date" and Prior to Any Extension of Time Request**	**Cost**
1983	"Engineering Investigation of the Banks Water System and a Master Plan for Future Development" prepared for the City of Banks by Klein Consulting Engineers. (WMCP 1-2)	Unavailable
1994	Completed construction of Carsten Reservoir Tank No. 1 (500,000 gallons). (WMCP Table 3-2).	$342,000.00
4/15/1994	"Preliminary Engineering Report for a Slow Sand Filter Water Treatment Plant" prepared for the City of Banks by Robert E. Meyer Consultants, Inc. (WSMP, 13)	Unavailable
12/1/1994	"Hydrogeologic Investigation, Water Resources Development" prepared for the City of Banks by Squier Associates to evaluate the ground water resources in the area surrounding the City of Banks. (WSMP Appendix B)	Unavailable
2/1995	City of Banks Water System Master Plan prepared by Robert E. Meyer Consultants, Inc.	Unavailable
1997	City constructed 12-inch water main loop and 8,000 lineal feet of 8-inch distribution piping to serve customers in new developments. (WMCP 3-7).	$190,000.00 to $300,000.00 (estimated)
9/1998	City of Banks Water System Master Plan Update prepared by Bookman-Edmonston Engineering, Inc.	Unavailable
1999	Completed construction of Carsten Reservoir Tank No. 2. (1,000,000 gallons) (WMCP Table 3-2).	$343,000.00 (projected cost)
2000	City of Banks added new telemetry and meters to monitor the production rate of the Behrman Well. (WMCP 3-5).	$25,000
1/2001	Water Management and Conservation Plan prepared for the City of Banks by LDC Design Group, Inc.	$70,000 (estimated)
2001	Purchase Kelly Field.	$415,000.00
1996-2001	Replaced well pump. (WMCP 3-5).	Unavailable
2002	Install new line from Well to Reservoir.	$19,000.00
3/22/2005	City began drilling Well #2.	$113,400.00
5/25/2005	City completed drilling Well #2. (*Exhibit G*).	Combined with

		above
12/28/2005	City filed Permit Amendment Application T-10055 to add Well #2 as an additional point of appropriation under Permit G-7593.	$350.00
2006	City implemented new water billing system	$11,000.00

5. **Evidence of compliance with conditions contained in the original permit and any previous extension(s). If any of the conditions have not been satisfied, please explain the reason(s) why.**

   The only specific condition contained in Permit G-7593 (attached as Exhibit A) required the City to "install and maintain a weir, meter, or other suitable measuring device, and shall keep a complete record of the amount of ground water withdrawn."

   1. The City installed appropriate metering devices to record the amount of ground water withdrawn.
   2. The City has consistently compiled a record of the amount of ground water withdrawn from the Behrman Well, and has submitted water use reports to the Department for this permitted withdrawal since at least 1988. (See City of Banks water use reports on OWRD website) http://apps2.wrd.state.or.us/apps/wr/wateruse_report/

6. **Evidence of the maximum rate of water diverted to date for beneficial use under the permit and/or prior extensions of time, if any, made to date.**

   Maximum instantaneous rate = 0.613 cfs (cubic feet per second).

   By letter dated July 14, 1993, in conjunction with the City's Final Proof Survey, and included within the Permit file, R.W. Klassen indicted that the maximum use reached 275 gpm (0.613 cfs). That is the largest recorded water use present in the water right file.

7. **An estimate of the population served under this permit and a description of the methodology(ies) used to make this estimate.**

   The City of Banks primarily serves the population within the City's boundaries, but also serves water service customers living outside the City. Currently, the City estimates that 1,876 people are served under Permit G7593. This figure comprises the approximate current population within the City of Banks' principal service area (defined as the city limits of the City of Banks) of 1,435 as of July 1, 2006, and the current estimate of 441 people served outside City limits (calculated at 98 homes served outside City limits with an average of 4.5 persons per household, 98 * 4.5 = 441)

   The City's current population estimates are derived from Portland State University Population Research Center's estimates, and were presented in Table 4 of the 2006 Oregon Population Report, attached as *Exhibit I* and available at http://www.pdx.edu/prc. The PRC's

methodology for its population estimates is explained in detail on page 4 of the 2006 Report. (*Exhibit J*).

8. **A description of the financial expenditures made toward completion of the water development under Permit G-7593.**

The City has been unable to locate some records related to financial expenditures made toward completion of the water development under Permit G-7593. To the extent available, expenditures are included in the Table accompanying Item #4. In some cases, expenditures were estimated according to the proposed or estimated cost, as contained in the City's WMCP, WSMP, WSMP update, or other City records.

Based on the located records, the City has expended more than $1,686,785 on projects and work related to its water system since 1977, and at least $205,435 on projects related directly to development of Permit G-7593. These totals do not include the cost of drilling the Behrman Well, nor do they include expenditures that could not be confirmed by the City because of missing records.

It is clear that since 1977, the City of Banks has invested substantial sums of money in developing its water system, including those parts of the system specific to the Behrman Well. Cost estimates and figures for each specific activity related to development of Permit G-7593 are located in response to Item #4 above.

9. **An estimate of the cost necessary to complete the water development.**

The intent of this extension application is to extend the development time of Permit G-7593 so that the City can obtain the Department's approval of the City's Permit Amendment Application T-10055. If granted, Permit Amendment T-10055 would allow the City to use Well #2, or a combination of Well #2 and the Behrman Well to pump ground water up to the permitted amount of 0.67 cfs, and thus fully develop Permit G-7593. Assuming that Permit Amendment Application T-10055 is approved, the City of Banks estimates that an additional $200,000 is necessary to place Well #2 online and complete water development.

This figure includes estimated legal, consulting, and administrative fees, as well as the cost of connecting the well to the current water system. Once the City's extension application and permit amendment are approved, the City will put the project out to bid and obtain a set figure for completing the necessary connection of Well #2 to the current water system.

10. **A summary of any events that delayed completion of the water development or application of water to full beneficial use, including other governmental requirements, if any, relating to the project that have significantly delayed completion of construction or perfection of the right.**

There are many events that delayed completion of the water development or application of water to full beneficial use under Permit G-7593. In general, the Behrman Well performed below its original specifications, and thus the yield was less than expected. Accordingly, the City has been limited at times of peak demand to a withdrawal of 0.613 cfs from the

Behrman Well. Due to a number of reasons, including governmental requirements, technical difficulties, economic and financial issues, rapid growth, and severe weather, the City lacked the necessary resources to fully develop the remainder of Permit G7593 until recently.

Technical difficulties: As noted, the City of Banks was unable to put 0.67 cfs of water to full beneficial use by the C-Date because the well performed below specifications. On August 25, 1977, the Behrman Well was test pumped for a 48 hour period, and the ensuing report by Klein Consulting Engineers indicated that the well could be pumped at a sustained rate of 300 gpm. However, the actual sustained pumping rate is somewhat less, and the City's only realistic and reasonable option to fully develop Permit G-7593 involved drilling an additional well. However, the City lacked the resources to do so, and for many years, the City could get by with the use of other sources to make up the difference at times of peak demand. However, a relatively recent explosion in growth has pushed the City's water system to capacity, and the City must fully utilize its current water permits and water rights to meet current and projected future demands.

Actual growth rates/peak demand: In general, the Behrman Well was developed to supplement the City's capacity during peak summer months. As a result, the Well is operated during the summer months to allow the City's water system to meet peak seasonal demands. (WMCP 2-3). However, recent rapid growth in the City has forced the City to rely more heavily on the Behrman Well and often the City is forced to exceed the recommended maximum daily running time of 18 hours per day to meet peak demands. (WMCP 2-4).

Economic Reasons: The City of Banks is a small municipality that operates on a tight budget. As the City's water system has aged, the City has expended significant financial resources maintaining and updating the current system, and investigating the most efficient and cost-effective methods of increasing the reliability of its water system. Accordingly, much of the work that was deemed necessary to ensure reliability of the current water system took precedence over developing the remainder of Permit G-7593. Such repairs and improvements have helped the City reduce leakage within the system, ensured the quality of the drinking water, and improved conservation methods within the City. The table accompanying Item #4 provides ample evidence of the public works investment the City has made in recent years to improve its water system. In addition, the City has expended significant funds on legal and consulting fees for activities associated with its water system development, including acquiring necessary easements and related litigation.

Severe Weather: In February 1996, severe flooding and an accompanying mudslide irreparably damaged the City's intake structure at the Large Spring (Certificate 5353), requiring the City to spend over $189,000 building a replacement.

Government requirements: The City was also required to build a sand filtration plant in response to the Federal Surface Water Treatment Rule, enacted in 1986. Accordingly, the City commissioned an appropriate study and built a slow-sand filtration plant, which was completed in 1997 at a cost exceeding $635,000.

Additional events: Increased logging activity on private land within the City's watershed put the City's water supply at risk of contamination. Accordingly, to protect the watershed the City purchased "Kelly Field" in 2001 at a cost of $415,000, and replanted the property with trees at a cost of approximately $21,000.

In recent years, the City has hired multiple consultants to examine the water system and evaluate options for expanding capacity of the system, especially during times of peak demand. The City's WMCP and Water System Master Plan both recommended maximizing existing sources of supply, while at the same time evaluating additional sources. Because all other sources are fully developed, the City desires to extend Permit G-7593 and develop the remainder of the permitted amount that has not been put to beneficial use.

11. An estimated demand projection and a description of the methodology(ies) used for the subject water right permit, considering the other water rights and contracts held by the municipal or quasi-municipal water use permit holder, and a date by which the water development is anticipated to be completed and water put to full beneficial use.

a. Inventory of Water Rights Held
An inventory of water rights held is attached as *Exhibit K*.

b. Water Supply Contracts and/or Agreements
The City of Banks does not currently have any water supply contracts or agreements with any other entities.

c. Current Peak Water Demands
The total rate of water being used to meet current peak demands for water from all water rights held by the City of Banks is 0.33 million gallons per day.

d. Projected Population and Future Peak Water Demands
The projected population growth rate and associated future peak water demands, are as follows:
- The City has adopted a population forecast of 3,739 persons by the year 2024.
- The City has yet to develop a peak water demand based on the official population forecast. The City is currently without a City Engineer, and anticipates that the new City Engineer will determine a future peak water demand. The City will supplement this application with that information when it is determined.

e. Potential Growth
In the foreseeable future, the City's service area could potentially expand to surrounding areas and future housing developments. These projects will require additional water demands, and the City is currently exploring additional sources of water to meet future demand. However, Permit G-7593 is necessary to meet current peak demands.

f. Anticipated Water Development Completion Date
The City anticipates that water development for Permit G7593 will occur within the next 1 to 2 years. However, this estimate is contingent upon approval of this extension

application and Permit Amendment T-10055, as well as having the financial resources necessary to put Well #2 online.

12. **A summary of the plan and schedule to complete construction and/or perfect the water right.**

As noted above, the City is currently in need of the extra capacity that will become available if this extension application is granted, and the Department approves Permit Amendment Application T-10055. Once the City's applications are approved and the City can permissibly use Well #2, the City anticipates that the Well can be put online within several months, after the City completes the public bidding process and secures a contractor to do so.

From a technical standpoint, to "complete construction" of Well # 2 the City must submit the project to the public bidding process and secure a contractor to perform the necessary tasks to complete the interconnection of the Behrman Well and Well #2, as well as the necessary connection to the current storage and distribution system.

13. **Justification for the time requested to complete the project and/or apply the water to full beneficial use.**

The City has already expended considerable effort and money to develop Well #2, which will allow the City to fully develop Permit G-7593 within a short time period. Although the City has requested 10 years to apply the water to full beneficial use, the City anticipates that application to beneficial use will occur much more quickly. Nevertheless, the City requests until 2017 to account for any unforeseen circumstances that may prevent the City from using the new well and further developing Permit G-7593. Of course, the City cannot put Well #2 online until its Permit Amendment Application T-10055 is approved by the Department. A recent letter to the City indicated that the processing time for extension applications could take several years, due to a backlog of requests. Accordingly, the time requested takes into account the potential delay due to the current backlog.

14. **Any other information you wish the Department to consider while evaluating the extension of time application.**

The City requests approval of the extension of time application to allow it to move forward with Permit Amendment T-10055 and bring Well #2 online. The addition of a second well will provide the City with the ability to fully perfect Permit G-7593, while improving the City's ability to meet peak demands, and the operating reliability of the Behrman Well. Currently, the City is forced to operate the Behrman Well above recommended operating times, which places the water supply at risk and could reduce well yield. This extension application is an important part of the City's attempts to secure a safe and sufficient water supply for its citizens.

Exhibit A: Permit G 7593
6 pages

Application No. G-8476 Permit No. G 7593

STATE OF OREGON WATER RESOURCES DEPARTMENT

Application for a Permit to Appropriate Ground Water

RECEIVED
SEP 20 1977
WATER RESOURCES DEPT
SALEM, OREGON

I, City of Banks, Oregon (Name of Applicant)

of City Hall (Mailing Address), Banks (City)

State of Oregon, 97106 (Zip Code) Phone No. Mayor Howard Steinbach 324-2251 do hereby
Robert Prickett, City Recorder 324-8462

make application for a permit to appropriate the following described ground waters of the State of Oregon:

1. The development will consist of one well (Give number of wells, tile lines, infiltration galleries, etc.)

having a diameter of 8 inches and an estimated depth of 450 feet.

2. The well or other source is to be located 135 ft. S (N. or S.) and 560 ft. W (E. or W.)

from the ¼ corner of on the north line of Section 31, T2N, R3W, W.M. (Public Land Survey Corner)

(If there is more than one well, each must be described)

being within the NE ¼ of the NW ¼ of

Sec. 31 Tp. 2N R. 3W, W. M., in the county of Washington

3. Location of area to be irrigated, or place of use if use other than irrigation.

Township	Range	Section	List ¼ ¼ of Section	List use and/or number of acres to be irrigated
SEE ATTACHED	SHEET #1			

4. It is estimated that 210 feet of the well will require 8 5/8" diameter welded steel (Kind) casing.

5. Depth to water table is estimated ..... (Feet) Well drilled by A.M. Jannsen Drilling Co. Aloha, Oregon

Form 690-3-0-1-77

RECEIVED
MAY 17 2007
WATER RESOURCES DEPT
SALEM, OREGON

6. *The amount of water which the applicant intends to apply to beneficial use is* ..... *cubic feet per second or* ....300..... *gallons per minute.*

7. *The use to which the water is to be applied is* ..municipal.....

.....

8. *If the flow to be utilized is artesian, the works to be used for the control and conservation of the supply when not in use must be described.*

(not artesian)

9. *If the location of the well, or other development work is less than one-fourth mile from a natural stream channel, give the distance to the channel and the difference in elevation between the stream bed and the ground surface at the source of development.*

Natural stream channel (intermittent flow) 130 feet due east of well. Well is 10 feet higher than streambed.

10. *DESCRIPTION OF WORKS*

Include length and dimensions of supply ditch or pipeline, size and type of pump and motor, type of irrigation system to adequately describe the proposed distribution system.

Water will be conveyed from well to existing city reservoir (as shown on attached map) through an 8-inch pipeline.

The proposed well pump will be a 40 H.P., 14 stage deep well turbine capable of delivering 300 gallons per minute to a 400 ft. T.D.H.

11. *Construction work will begin on or before* Well construction - August 16, 1977 Pump & pipeline - January, 1978

12. *Construction work will be completed on or before* Well construction - August 24, 1977 Pump & pipeline - June, 1978

13. *The water will be completely applied to the proposed use on or before* July, 1978

14. *If the ground water supply is supplemental to an existing supply, identify the supply and existing water right.* See attached map showing existing water supply system. Water right certificate no. 5353.

Application No. G-8476 *Permit No.* G 7593

SHEET #1

3. Location of area to be irrigated, or place of use if use other than irrigation.

Township	Range	Section	List ¼ ¼ of Section
T2N	R3W	29	SW¼ SW¼
T2N	R3W	30	NW¼ SW¼
			SW¼ SW¼
			SE¼ SW¼
			SW¼ SE¼
			SE¼ SE¼
T2N	R3W	31	NW¼ NW¼
			NE¼ NW¼
			NW¼ NE¼
			NE¼ NE¼
			SE¼ NE¼
			SE¼ NW¼
			SW¼ NW¼
			NW¼ SW¼
			SW¼ SW¼
T2N	R3W	32	NW¼ NW¼
			SW¼ NW¼
T2N	R4W	25	NE¼ SE¼
			SE¼ SE¼
			SW¼ SE¼
T2N	R4W	36	NW¼ NE¼
			NE¼ NE¼
			SE¼ NE¼
			NE¼ SE¼
			SE¼ SE¼

Application No. G-8176
Permit No. G 7593

SHEET #2

REMARKS:

The City of Banks presently obtains it's water supply from springs about 4 miles north of the City (see Water Right Certificate No. 5353 and attached map). The present supply is not sufficient to meet summer-time needs; therefore a new well was constructed. At present, Banks supplys water to 747 persons and in year 2000 it is estimated that 1,971 persons will be served. Average day water requirements are presently 104,500 G.P.D. and in year 2000 it is estimated to be 276,000 G.P.D.

Requirements of the average day of the maximum month are presently 200,000 G.P.D. and in year 2000 it is estimated to be 524,000 G.P.D. The present supply (springs) can provide 173,000 G.P.D. and the proposed well can supply 432,000 G.P.D. for a total of 605,000 G.P.D. which will meet the estimated needs in year 2000.

Application No. G-8476
Permit No.

Remarks: SEE ATTACHED SHEET #2

Howard D. Steinbach Mayor
Signature of Applicant
City of Banks, Banks, Or.

This is to certify that I have examined the foregoing application, together with the accompanying maps and data, and return the same for

In order to retain its priority, this application must be returned to the Water Resources Director with corrections on or before , 19

WITNESS my hand this ..... *day of* , 19

..... *Water Resources Director*

By .....

RECEIVED
MAY 17 2007
WATER RESOURCES DEPT
SALEM, OREGON

This instrument was first received in the office of the Water Resources Director at Salem, Oregon, on the 29TH *day of* SEPTEMBER, 19 77, *at* 8:00 *o'clock* A *M.*

Application No. G-8476 *Permit No.* G 7593

Application No. G-8476 Permit No. G 7593

Permit to Appropriate the Public Waters of the State of Oregon

This is to certify that I have examined the foregoing application and do hereby grant the same, SUBJECT TO EXISTING RIGHTS INCLUDING THE EXISTING MINIMUM FLOW POLICIES ESTABLISHED BY THE WATER POLICY REVIEW BOARD and the following limitations and conditions:

The right herein granted is limited to the amount of water which can be applied to beneficial use and shall not exceed 0.67 *cubic feet per second measured at the point of diversion from the well or source of appropriation, or its equivalent in case of rotation with other water users, from* a well

The use to which this water is to be applied is municipal.

If for irrigation, this appropriation shall be limited to ..... of one cubic foot per second or its equivalent for each acre irrigated and shall be further limited to a diversion of not to exceed ..... acre feet per acre for each acre irrigated during the irrigation season of each year;

and shall be subject to such reasonable rotation system as may be ordered by the proper state officer.

The well shall be constructed in accordance with the General Standards for the Construction and Maintenance of Water Wells in Oregon.

The works constructed shall include an air line and pressure gauge or an access port for measuring line, adequate to determine water level elevation in the well at all times.

The permittee shall install and maintain a weir, meter, or other suitable measuring device, and shall keep a complete record of the amount of ground water withdrawn.

The priority date of this permit is September 29, 1977

Actual construction work shall begin on or before December 2, 1978 *and shall thereafter be prosecuted with reasonable diligence and be completed on or before October 1, 19*79

*Complete application of the water to the proposed use shall be made on or before October 1, 19*80

WITNESS my hand this 2nd *day of* December, *19*77

James E. Sexton
Water Resources Director

Exhibit B: Water Management and Conservation Plan, for City of Banks, Oregon
93 pages

WATER MANAGEMENT AND CONSERVATION PLAN

For

CITY OF BANKS, OREGON

January 2001

LDC Design Group Inc.

CITY OF BANKS
WATER MANAGEMENT AND CONSERVATION PLAN

EXECUTIVE SUMMARY

PURPOSE AND SCOPE

The City of Banks has obtained drinking water from three springs in the hills north of the City for over 75 years. This supply was augmented 20 years ago by the completion of the Behrman Production Well. Rapid population growth since 1996 has sharply increased the City's dependence on groundwater resources to meet peak demands. Consequently, the City has no excess capacity in its water supply system during periods of high demand.

The City has authorized the preparation of this report to identify its water needs through 2020 and evaluate the water resources available to reliably meet these needs. The report addresses both demand-side and supply-side management of water resources in accordance with Oregon Administrative Rules Chapter 690, Division 86 (OAR 690-86). These rules specifically identify the topics to be covered in a Water Management and Conservation Plan for a municipal water supplier. The report includes information on Existing Sources of Supply, Existing Water System, Population and Water Use, Water Conservation or Demand-Side Water Management, Supply-Side Water Management and an Emergency Curtailment Plan.

Water management planning can function as an important tool in helping the City use its existing and future water supplies more efficiently. Historically, water management planning has concentrated on the development of new water supply projects or an expansion of existing facilities to meet increasing customer demands. Under current State policy, the emphasis has now been shifted to place equal importance on water conservation as an alternative source. For Banks, this approach can potentially increase system reliability, reduce capital expenditures on future water supply improvements and limit impacts on local aquifers. Water conservation represents a demand-side resource and one objective of this plan is to provide information that will help the City develop this resource.

EXISTING SOURCES OF SUPPLY

The City of Banks' water supply includes both surface water and groundwater sources. Surface water from the Green Mountain Springs serves as the primary source and groundwater is used to augment the supply capacity during periods of high demand.

To meet average daily demand the City should be able to rely on minimum yields for the Large and Small Springs of about 90 and 20 gallons per minute (gpm), respectively. This translates to a total daily yield of 158,000 gallons per day.

The Behrman Well is operated during the summer months to allow the system to meet peak seasonal demands. The City has reported that the existing well pump is designed to produce a flow rate of 250 gpm; however, records of the pump design data have not been located. A total daily yield of 270,000 gallons per day can be supplied to the system, with the pump running 18 hours per day.

EXISTING WATER SYSTEM

The City of Banks water system, shown in Figure ES-1, provides water to the City residents and a number of customers outside the City. The surface water from the Green Mountain Springs is directed to customers by gravity. Intake structures divert flows from the springs into raw water transmission pipelines. Two separate transmission lines, one from the Large Spring and another from the two Small Springs, carry the raw water to the slow-sand filtration plant. The intake structure at the large springs and the treatment plant were both constructed less than five years ago.

A 6-inch transmission main brings the filtered water from the plant to the 70,000-gallon North Star Reservoir. Chlorine is used for disinfection at the influent to the North Star Reservoir. A 3-mile long, 6-inch treated water transmission main runs between the North Star Reservoir and the two Carsten Reservoirs, (500,000 and 1,000,000 gallons respectively), just north of Banks' city limit. The water surface elevation in these reservoirs maintains operating pressure in the distribution system. The Carsten Reservoirs are both less than 10 years old, however the transmission main and the North Star Reservoir were both recommended to be replaced in the 1998 Water System Master Plan Update due to their age and condition.

A 14-inch transmission main connects the Carsten Reservoirs to the City's distribution system. The distribution system serves the entire City and small areas to the east and west of the City. The system is looped and a large portion of the mains are less than five years old.

The Behrman Well pumps groundwater into the 14-inch transmission main just upstream of its connection to the distribution system. Chlorination equipment is also located at the wellhead to disinfect the well discharge.

POPULATION AND WATER USE

Population Banks has been experiencing rapid growth during the last couple of years due to the construction of the Arbor Village-South Banks Estates developments. The City population of 570 remained relatively stable through early 1990's, then grew rapidly to 625 in 1997, 845 in 1998 and 1310 in 1999.

Housing construction has continued at a strong pace during late 1999 and early 2000 and the population most likely topped 1,500 during 1999. The population growth will slow as the Arbor Village development nears full build-out. The population is projected to reach 1882 inside the City in 2020.

The 1998 Master Plan Update estimated the outside residential population served by the City to be 308 people. This number is not expected to change as the City no longer allows new connection outside the City limits.

Demand During the three-year period from 1996 through 1998, the overall average per capita water use, or average daily demand, was approximately 125 gallons per day. During 1999 this amount dropped to 109 gallons per capita day. The per capita figure is based on total metered water use, it does not include an allowance for distribution system leakage or unmetered uses. The peak monthly demand was approximately twice the average daily demand, which is typical for small communities.

To project future water use, an estimate of future average per capita water consumption was developed. It has been estimated that future average per capita residential demands in the City will be about 85 gallons per capita day (gpcd). Outside the City, the residential per capita demand will not change in the future relative to current per capita demands of approximately 90 gpcd, which equates to 9.9 million gallons per year.

Future commercial demands in the City will make up about 12 percent of the total system demands after the Year 2005. This value corresponds to the proportion identified for 1997. Commercial demands outside the City have been projected to remain constant at 200,000 gallons per year. It has been assumed the school district's demand will increase by 10% to year 2005 and remain unchanged from 2005 to 2020. No growth in green space irrigation is anticipated. Banks Lumber Mill is not anticipated to change operations and future water demand should be approximately the same as 1997 metered demand records.

In 1999, the average daily demand was 175,890 gallons per day. The demand will quickly grow as the developments are completed and then moderate after 2005. The 2005

to 2025 water production requirements are relatively constant due to decreasing loss and increasing demand.

An average daily demand to peak demand ratio of 2.2 is used for projecting demand. This ratio is greater than the average monthly demand to peak monthly demand ratio over the past four years of 1.9. The average daily demand in 2005 will be approximately 293,000 gallons per day. The peak daily demand will therefore be 645,000.

SUPPLY CAPACITY

The supply consists of three sources; the Behrman Well, the Large Springs and the Small Springs. Taken together, the system supply at minimum flows will provide 428,000 gallons per day. The system supply capacity will not meet projected peak demands. In the year 2005 to 2025 the City supply will be 220,000 gallons per day below the peak daily demand, or approximately a 150 gpm deficit.

CONSERVATION

Water Conservation can function as an important tool in helping the City use its existing and future water supplies more efficiently. Historically, water management planning has concentrated on the development of new water supply projects or an expansion of existing facilities to meet increasing customer demands. Under current State policy, the emphasis has now been shifted to place greater importance on water conservation as an alternative source. For Banks, this approach can potentially increase system reliability, reduce capital expenditures on future water supply improvements and limit impacts on local aquifers.

The City of Banks had not had a Water Conservation Plan until it adopted a comprehensive conservation program in September 2000. The conservation measures that were considered here generally fall within the following three broad categories:

- those that consist of educational or administrative measures designed to modify water-use behavior patterns; and
- those that include the installation of devices, equipment or materials that reduce the flow of water or require less water; and
- those that shift irrigation uses for major irrigators from treated water to another source.

The conservation program was established through a water use ordinance. This ordinance authorizes the implementation of a conservation program and endorses a policy of promoting efficient water uses. This conservation program could produce an additional

three to five percent reduction in the projected average demands by 2020. Peak demand reductions of 10 to 20 percent could also be realized relative to the projections for 2020.

Recommendations: To achieve the greatest conservation without major lifestyle changes, the conservation program recommendations include

- Begin process of switching all large irrigators to TVID water, this will involve permitting and construction of new facilities.
- Move to odd/even day scheduling for outdoor irrigation until additional sources are on-line.
- City begin funding a Water System Conservation Coordinator position.
- Require new construction and remodels to use ultra-low-flow (ULF) fixtures.
- Perform water audits on commercial customers.
- Purchase and mail conservation information.
- Purchase a supply of door hangers, to advise customers when conservation action is requested or required.

SUPPLY SIDE WATER MANAGEMENT

Supply-side water management is defined as programs or actions designed to increase water supply. This is the traditional method of dealing with growth in a water system. With the ongoing rapid development in south Banks, the water supply and demand situation in Banks has both near-term and long-term considerations. Under the general area of near-term supply options various methods to maximize utilization of existing sources have been examined. Long-term supply options are generally new sources of supply the City does not currently utilize.

Near Term Options include the large springs portion of the Green Mountain springs which provide generally excellent quality water. Options to increase available water from this source are limited to a replacement of the raw water line, as the intake currently collects all of the available water. This could limit losses and increase the amount of water arriving at the treatment plant. **Probable project cost: $260,000. Probable annual costs: $28,200. Increase in water available: 0-10gpm.**

The small springs, also located in the Green Mountain Springs watershed area are a very valuable resource with a minimum flow of 20 gpm. However, the high turbidities found in the small spring source water require some type of treatment prior to reaching the slow sand filter. Three general options for treatment are considered in this report: a conventional treatment plant, a flocculation basin, and an infiltration gallery.

The flow from the Large Green Mountain Springs is low turbidity water and does not warrant, at this time, a full conventional treatment process. Due to a lack of need for this

type of treatment the benefits and costs of this type of treatment process, have not been analyzed.

A flocculation/clarification facility can be sized to provide reduction of the turbidity without the need to build a separate sedimentation basin. Annual maintenance and operations cost will depend upon the amount of flocculent and length of time the equipment is in use. **Probable project cost: $95,000. Probable annual costs: $16,200. Increase in water available: 20gpm.**

Another solution to the problem of turbidity and to increase the efficiency of collection of the available water, is to build an infiltration gallery to collect the water. With an infiltration gallery the water would essentially be pre-filtered as it is collected at the source. Construction of the infiltration gallery is complicated by the need for an impounding structure, a dam, to hold the water and allow time for the gallery media to work properly. Additionally, to make the gallery stable and protected from the very turbid wet weather flows, a dam with a bypass capability would have to be constructed. Annual maintenance for this facility could fluctuate substantially depending upon the amount of highly turbid water reaching the gallery. **Probable project cost: $132,000. Probable annual costs: $20,600. Increase in water available: 20gpm.**

Additional springs are located in the general area of the Banks watershed. However, the water quantity is too small and further consideration of these springs has been suspended.

Behrman Well. The City of Banks has been using the Behrman Well for approximately 20 years. Any increase in use to meet the projected water supply demands would lower operational reliability, and is not recommended.

<u>Recommendations</u> – **Near Term** The first priority for the City should be to begin using the Small Springs again. It is our recommendation that the City pursue the installation of a package flocculation/clarification system for the reduction of turbidity from the small springs. This is the best near term solution for increasing the water supply.

Long-term Water Supply Options for Banks include groundwater, surface water, purchasing treated water and purchasing untreated water. Any of the sources considered in this section could be considered a third major source of supply, they are:

1. Additional Groundwater Source
    a. New Spring
    b. New Production Well
2. Purchase of Treated Water from the City of Forest Grove
3. Purchase of Raw Water from Tualatin Valley Irrigation District (TVID)
4. Water Transfer from City of Forest Grove to TVID

5. Switching of Use-using raw water from TVID for Irrigation.

New Spring. Less than one mile north of the existing Large Springs is the Howell Spring with a water right dating to November 9, 1923. After checking with the owners of the property, we find that this spring is being utilized and the owners show no interest in relinquishing any right to this water.

Approximately 0.5 miles west of the Howell Spring is a much larger spring. The spring is known as the Neuman Spring. For the benefit of being able to provide a cost and operation comparison, we have assumed that the water right would be transferable, and that a minimum of 0.20 cfs (129,260 gallons per day) would be available for use. We estimate that approximately 1.1 miles of pipe and a pump station will be required to reach from Neuman Spring to the Large Green Mountain Springs Intake Structure. **Probable project cost: $435,000. Probable annual costs: $53,900.**

Additional Well Another option is the development of a new production well. While this source might appear to be the easiest to accomplish, it is the source with the most risk. A 1994 hydrological report recommended a site southwest of the intersection of Wilson River Highway 6 and Highway 47 as a potential location for a new well. This site fits the distribution system very well in that a major water main is very close and there are distinct operation advantages in having a source of supply south of the City.

The reported hydrogeologic characteristics suggest it could produce 150 – 400 gpm. After discussions with the Oregon Department of Water Resources (ODWR), we have determined that the lead time to get a water right in the proposed location will be approximately eighteen months. **Probable project cost: $434,000. Probable annual costs: $60,000.**

Purchase from Forest Grove The Oregon Department of Water Resources encourages interconnections with other municipal supply systems. The Forest Grove water system is approximately 5.3 miles south of the Banks water system along Highway 47. A connection between the two systems would require a new pipeline to be constructed along Highway 47. A Booster Pump Station would be required to transport the water to Banks and match the water system pressure in south Banks, which is approximately 90psi. The annual costs, when the cost for purchasing water is included, are more difficult to estimate. The purchase of water is subject to a negotiated price.

The feasibility of the whole project revolves around the willingness of Forest Grove to sell water to Banks. Initial conversations with Forest Grove indicate they are not interested in selling water to Banks. **Probable project cost: $3,214,000. Probable annual costs: $399,000.**

TVID The potential purchase of water from the Tualatin Valley Irrigation District could be used to supply the irrigation demands in the City. The potential reduction in demand for the City water system is significant, and this will save money for the large users such as the School District and the Arbor Village Homeowners Association. The permitting process, especially for the school district property outside the TVID service area, will take time and money to complete.

Currently the Tualatin Valley Irrigation District has a water line that leads to the east side of the lumber mill property. The major cost in constructing a connection to the parks and school would be to bore a water line under the railroad, in addition to the rest of the water line. The funding for this and the initiative should come from the Arbor Village Homeowners Association.

Treat TVID Water Another potential option for the City of Banks is to purchase untreated water from the Tualatin Valley Water District. This water could then be treated and used in the water system. The purchase of water from an irrigation district for municipal use is a different matter when it comes to permitting. The process will take time and a positive outcome is not guaranteed. The costs for developing this source, outside of the permitting and legal process, would include a pipeline, a package treatment plant and possibly a small pump to boost the pressure. The long-term reliability and viability of this source need to be further investigated in the course of acquiring the permits for this project.

Wheeling of Water The general idea is to use the City of Forest Grove's water rights, but instead of purchasing treated water and constructing a new pipeline, the water would be transported through the irrigation district's pipelines. A wheeling charge, or charge to transport the water would be applied. Then when the water is delivered the water would still need to be treated, similar to the previous option. The unknowns in the permitting process make this a low recommendation.

Recommendations – Long Term It is our recommendation that the City of Banks should act as a catalyst to move the large irrigators off the City water system and on to Tualatin Valley Irrigation District water. This is a low cost method of lowering the peak demand on the City water system and over time saving the irrigators money. Additionally, for a long term source of supply the City should authorize a detailed design study for a new well. A detailed cost estimate and an analysis of potential funding sources is needed as a first stage towards securing a long term water source for the City.

CURTAILMENT PLAN

The Curtailment Plan is an important tool to help the City deal with emergencies that could develop quickly or emergencies brought on by drought which would progressively impact water supply and demand. The Plan prioritizes use of limited water supplies to protect public safety and health during an emergency. The Plan will also provide gradually increasing levels of use curtailment, both voluntary and mandatory to deal with a shortage.

The water-use curtailment plan is designed to help the City allocate limited water supplies so that public health and safety can be protected during water emergencies. To support this purpose water use must be prioritized, insuring the best use of limited supplies. Water use is prioritized in the following categories, listed with the primary uses first:

1. Minimum essential indoor residential use and fire protection;
2. Minimum essential indoor uses by nonresidential customers, including schools, commercial establishments and Banks Lumber;
3. Outdoor uses and discretionary indoor uses by all customers; and
4. New customers who are not served at the time the water shortage occurs.

Recommendation: A water restriction ordinance was approved in September of 2000, allowing the City to implement the curtailment plan in case of a water emergency. The triggering mechanisms, stages of emergency, and curtailment actions can be incorporated into the ordinance by reference. The curtailment actions, triggering mechanisms and stages of emergency are summarized below:

Stage 1,
Shortage Condition - Well running time greater than 18 hrs. /day
Curtailment Method - Voluntary. Request major landscape irrigation customers to curtail all outdoor water use. Identify alternate day irrigation schedules for schools, parks and green space.

Stage 2,
Shortage Condition - Well running time of 20 hrs./day.
Curtailment Method - Voluntary & Mandatory. Mandate that major landscape irrigation customers limit outdoor water use based on irrigation schedule. Also issue notice to public requesting all users to voluntarily conserve water.

Stage 3,
Shortage Condition - Tank No. 2 less than 15 feet deep or well running time of 22 hrs./day.
Curtailment Method - Voluntary & Mandatory. Limit all outdoor water use to alternate day schedule during time period from 5 p.m. to 9 am, limit irrigation to 20 minutes in any one sprinkler zone, and prohibit home car washing, washing of outdoor pathways, driveways and other similar areas.

Stage 4,
Shortage Condition - Tank No. 2 less than 12 feet deep or Large Spring out of service.
Curtailment Method - Voluntary & Mandatory. Order suspension of all outdoor water use and request all customers to voluntarily curtail indoor use.

Stage 5,
Shortage Condition - Well out of service
Curtailment Method - Mandatory. Continue suspension of all outdoor water use and issue notice of mandatory reduction in water use for indoor purposes.

CONCLUSION

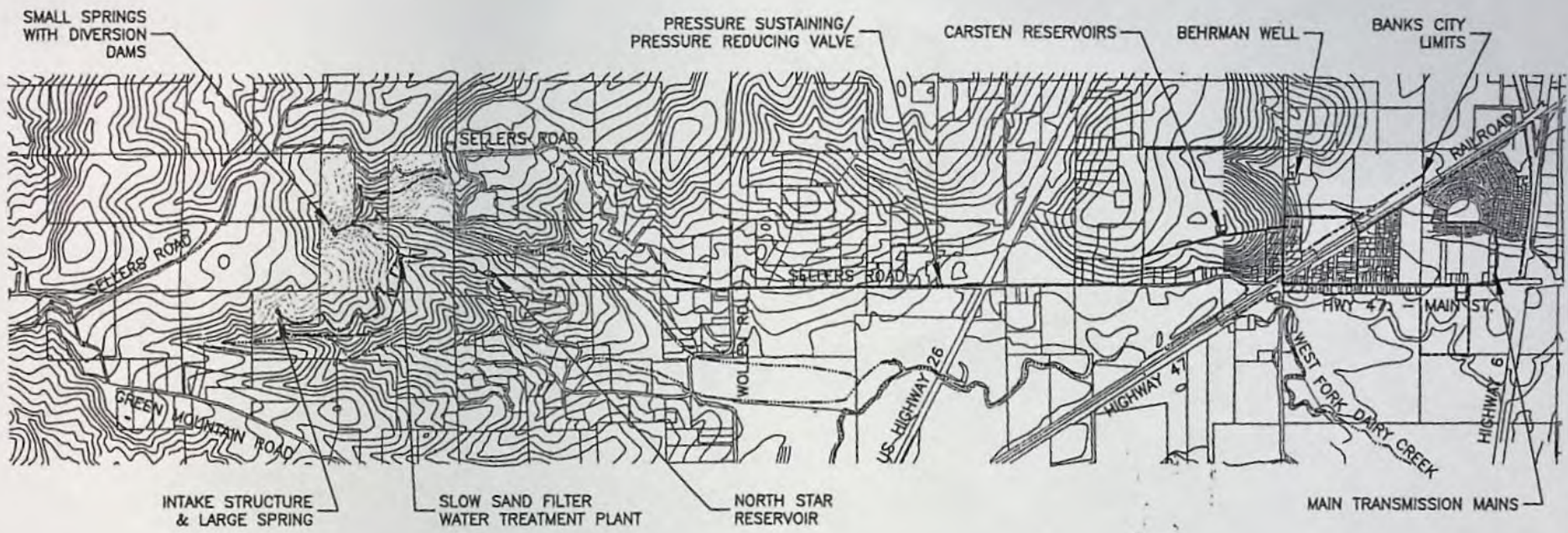
Due to continued growth and declining water resource availability from existing sources an additional new source of supply will be needed soon. Water conservation which includes shifting of irrigation use to another source, will not be enough to meet peak demands that would be typical of an extended drought. Another new source located on the south side of town is recommended. We arrived at this conclusion from our research and meetings with other water purveyors. Other water purveyors are not at this point, nor in the near term of this study coverage, interested in selling water to the City of Banks. Not only are costs very high to accomplish a tie-in with another water purveyor, such as the City of Forest Grove, the over all water resource picture is showing declining availability in all areas of Western Oregon. For the period beyond this study period (beyond 2020) a close evaluation of participation in a long-term water supply project is advisable as a large project is the lowest cost long-term solution.

The study recommends three projects be accomplished soon. They are:

1) Switch irrigation water to a new water source,
2) Begin the process of purchasing an additional well on the south side of Banks.
3) Provide the necessary treatment process to enable the small Green Mountain Springs to be used on a year around basis.

The City should:

1) Begin replacement of the old steel and galvanized waterlines to further reduce water loss
2) Continue the moratorium on extension of water service outside the City.
3) Be prepared to enact the provisions of the water use curtailment plan.
4) Actively pursue water conservation measures.



LEGEND

- STREAM
- TREATED WATER MAIN
- RAW WATER MAIN
- PROPERTY LINE
- CITY OF BANKS PROPERTY
- CITY LIMITS
- CONTOUR (40')
- SPRING LOCATION
- ACCESS ROAD
- RESERVOIR

N

2000' 0 1000' 2000'

SCALE 1" = 2000'

LDC Design Group Inc.

WATER MANAGEMENT AND CONSERVATION PLAN
WATER SYSTEM MAP
CITY OF BANKS, OREGON

FIGURE ES-1

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SECTION ONE
INTRODUCTION

2 SECTION TWO
EXISTING SOURCES OF SUPPLY

3 SECTION THREE
EXISTING WATER SYSTEM

4 SECTION FOUR
POPULATION AND WATER USE

5 SECTION FIVE
WATER CONSERVATION

6 SECTION SIX
SUPPLY-SIDE WATER
MANAGEMENT

7 SECTION SEVEN
WATER-USE CURTAILMENT PLAN

8 SECTION EIGHT
SCHEDULE FOR PLAN
IMPLEMENTATION AND
UPDATING

CITY OF BANKS
WATER MANAGEMENT AND CONSERVATION PLAN

SECTION ONE

INTRODUCTION

BACKGROUND

The City of Banks has obtained drinking water from three springs in the hills north of the City for over 75 years. This supply was augmented 20 years ago by the completion of the Behrmen Production Well. Rapid population growth since 1996 has sharply increased the City's dependence on groundwater resources to meet peak demands. Consequently, the City has no excess capacity in its water supply system during periods of high demand.

The City has authorized the preparation of this report to identify its water needs through 2020 and evaluate the water resources available to reliably meet these needs. The report addresses both demand-side and supply-side management of water resources in accordance with Oregon Administrative Rules Chapter 690, Division 86 (OAR 690-86). These rules specifically identify the topics to be covered in a Water Management and Conservation Plan for a municipal water supplier.

WATER MANAGEMENT PLANNING - OBJECTIVES

Water management planning can function as an important tool in helping the City use its existing and future water supplies more efficiently. Historically, water management planning has concentrated on the development of new water supply projects or an expansion of existing facilities to meet increasing customer demands. Under current State policy, the emphasis has now been shifted to place greater importance on water conservation as an alternative source. For Banks, this approach can potentially increase system reliability, reduce capital expenditures on future water supply improvements and limit impacts on local aquifers.

Water conservation represents a demand-side resource and one objective of this plan is to provide information that will help the City develop this resource. Conservation typically results in more efficient use because of the following key advantages:

- Water conservation is often a lower cost resource relative to supply-side water improvements.
- Water conservation programs can be implemented more quickly than most traditional water supply projects.
- Water conservation can reduce power consumption for potable water production.
- Water conservation generally results in fewer environmental impacts than a water supply project.

PREVIOUS REPORTS

This report utilizes the 1998 Water System Master Plan Update, prepared by Bookman-Edmonston Engineering, Inc., for descriptions of the existing water system. Some of the population data and assumptions included in that Master Plan Update have also been used in this study. Other past reports that were also used as references for this project are listed below.

- Water Supply Report, Banks, Oregon and Vicinity; Robert E. Meyer Engineers, Inc.; 1968.
- Engineering Investigation of the Banks Water System and a Master Plan for Future Development; Klein Consulting Engineers; 1983.
- Hydrogeologic Investigation, Water Resources Development, City of Banks, Oregon; prepared by Squier Associates; 1994.
- City of Banks Water System Master Plan; Robert E. Meyer Consultants, Inc.; 1995.
- City of Banks, Water System Master Plan Update, Bookman-Edmonston Engineering, Inc.; 1998.
- DRAFT - Source Water Assessment: Drinking Water Protection Area Delineation and Sensitivity Analysis for the City of Banks, Oregon; prepared by the Oregon Health Division, Drinking Water Program; 1998.

ORGANIZATION OF STUDY

Guidance provided by the Oregon Water Resources Department (WRD) in OAR 690-86 has been used in the development of this Water Management and Conservation Plan. The following is a summary of the Sections and their contents included in this plan.

Executive Summary:	Provides overview of the study and recommendations for action.
Section One:	Introduction - presents general background information.
Section Two:	Existing Sources of Supply - describes sources, water rights, limitations, and long term yields.
Section Three:	Existing Water System - describes the current water system and recommended improvements.
Section Four:	Population and Water Use - presents historical and projected populations and water demands.

Section Five:	Water Conservation - evaluates conservation measures, and presents recommendations for a conservation program.
Section Six:	Supply-Side Water Management - discusses water supply options, including long-range alternatives.
Section Seven:	Emergency Curtailment Plan - addresses water emergencies and a curtailment plan.
Section Eight:	Schedule for Plan Implementation and Updating - presents schedule for a plan implementation conservation program and an update to this Plan.

GENERAL INFORMATION

Planning Area. The City of Banks is located in central Washington County about six miles north of Forest Grove at the intersection of State Routes 6 and 47. The City lies at the western edge of the Portland metropolitan area and exists with a separate Urban Growth Boundary (UGB) that corresponds to the City limits. Banks provides water service to all City residents and approximately 300 residents that live to the north, east and west of the City.

Banks was historically a rural town with an economy driven by the timber and agriculture industries. The Banks Lumber Company continues to operate a mill adjacent to the east side of the City and the City is surrounded by farmland. However, due to its proximity to the rapidly-growing Hillsboro area, Banks has increasingly become a bedroom community for workers in other industries.

Geographical Summary of the City. Banks is situated in the northwest corner of the Tualatin River basin. The western boundaries are approximately 100 feet west of Highway 47 right-of-way except for the area known as Sunset Park. The topography of the City primarily consists of flat lowlands that are common near streams in the Tualatin Valley. The foothills of the Coast Range do, however, begin to rise at the north end of the City. Most of the City falls between elevations of 200 and 220 feet above sea level. The northwest corner of the City reaches a maximum elevation of about 275 feet.

There are no significant natural resources within the City. The West Fork of Dairy Creek which lies outside the boundaries of the City is, however, classified as essential habitat for anadramous fish species that have been listed as endangered under Federal law.

The watershed from which Banks draws its water supplies is tributary to the West Fork of Dairy Creek and lies about 3.5 to 4.0 miles north of the City. The terrain within the watershed is hilly with moderate to steep slopes, except for the northernmost area which

is gently sloping. The watershed was forested until early 1999, when clear cutting of all acres except City owned land occurred. Gently sloping sections along Sellers Road, which have been cleared for farming, are part of the watershed. The elevations within the City's water supply watershed generally range from about 700 to 1200 feet. The City owns 117 acres in and around the watershed which contain significant timber resources. The total recharge area for the springs is approximately 1000 acres.

Climate. Banks experiences a temperate climate with cool, wet winters and warm, dry summers. Typically, the wettest period occurs during December and January and the driest weather occurs in July and August.

The watershed used for the City's supply generally experiences more precipitation and colder temperatures than the low-lying areas of the Tualatin Basin (and the City of Banks) due to its higher elevation.

Throughout this plan the theme is to maximize utilization of existing water resources together with an active conservation program. Even with accomplishing the two themes noted above, additional resources will be needed due to growth and declining water supply from the Green Mountain Springs.

CITY OF BANKS
WATER MANAGEMENT AND CONSERVATION PLAN

SECTION TWO

EXISTING SOURCES OF SUPPLY

GENERAL DESCRIPTION

The City of Banks' water supply includes both surface water and groundwater sources. Surface water from the Green Mountain Springs serves as the primary source and groundwater is used to augment the supply capacity during periods of high demand. Brief descriptions of each source are presented in the following paragraphs, and an overall map of the system is shown in Figure 2-1.

Surface Water Supply. The Green Mountain Springs are located about 3.5 miles north of Banks and were developed as the City's source of supply in 1924. The City has historically taken water from the larger upper spring and two nearby smaller springs (see Figure 2-2). The use of the Small Springs was, temporarily discontinued due to high turbidity levels, during 1997-1999. However, the Small Springs are again being used during periods of dry weather.

The City purchased approximately 117 acres surrounding the Green Mountain Springs during the 1930s and 1940s to protect the immediate drainage areas. Concrete diversion structures have been built across the gully just below each spring to collect the water. The streams fed by the springs are tributary to the West Fork of Dairy Creek. The Oregon Health Department has completed a draft delineation of the recharge area for the springs. The recharge area is shown in Figure 2-3, and is approximately 1000 acres.

The water quality from the Large Spring is generally excellent; however, turbidity levels increase during the wet weather months. A slow-sand filtration plant was constructed in 1997 to treat water from the springs in accordance with the Surface Water Treatment Rule. Because slow-sand filters are sensitive to high turbidity levels, flows to the plant need to be shut off on occasion in the winter.

To place the Small Springs back into service on a regular basis some type of pretreatment will be required to reduce raw water turbidity. This issue will be addressed in Section Six.

Groundwater Supply. The City completed development of the Behrman Well in 1979 after well testing was performed in 1977. This production well is located on the south side of Banks Road about 2,000 feet east of Main Street (See Figure 2-1). The depth of the well is 450 feet.

The well draws water from aquifers in the underlying Columbia River Basalt Group. This geologic formation was created by a series of lava flows of Miocene age and is 500 to 900 feet thick in the northwest portion of the Tualatin Basin. The report prepared during well testing indicates the basalt was first encountered at a depth of 130 feet. Basalt tends to be of low permeability and does not yield much groundwater. Therefore, the aquifers that produce significant yields generally coincide with the interflow zones that occur between the successive lava flows. Vesicles, flow breccias and weathering that can exist along these zones produce the permeability needed for favorable groundwater conditions. Groundwater recharge of the Tualatin Basin aquifers occurs from precipitation and infiltration in the upland areas along the basin periphery. Groundwater flows along the permeable zones as they flow downward into the Basin.

WATER RIGHTS

Naturally occurring water in the State of Oregon is owned collectively by its citizens. The Oregon Water Resources Department has the authority to serve as the trustee of these public waters and requires a permit for any beneficial use. The water rights awarded by these permits are prioritized by seniority; hence the term "first in time, first in right." Holders of water rights of lesser seniority may be required to reduce consumption so that more senior holders can use their full permitted amounts.

The water rights that the City owns for the springs and production well are detailed in Table 2-1.

Table 2 - 1
City of Banks Water Rights

Source	Location	Permit No.	Priority Date	Permitted Yield (gpm)
Large Spring	T2N R4W Sect. 12 SENE	5353	10/23/23	188.5
Small Springs	T2N R3W Sect. 7 NWSW	48173	8/25/83	80.8**
Behrman Well	T2N R3W Sect. 31 NENW	G7593	9/29/77	300.7
Total Amount	---	---	---	570.0

** The water rights for the Small Springs consist of 40.4 gpm for each of the two springs.

The total amount of 570 gpm translates to about 820,000 gallons per day. However, during the summer the reliable yield of these sources is significantly less than this. The following subsection addresses the limitations of each water source.

LIMITATIONS AND LONG TERM YIELD

Surface Water Supply. The minimum reliable capacity of the Large Spring was reported to be 110 gpm in a 1983 study of the water system prepared by Klein Consulting Engineers. The report indicated this summertime flow rate had been measured on several occasions. The minimum capacity of the Small Springs was stated to be 30 gpm in the Klein report; however, Figure II in the same document lists a flow rate of 20 gpm. It was not indicated whether flow rates from the Small Springs were measured or estimated.

A 1968 Water Supply Report prepared for the City of Banks by Robert E. Meyer Consulting Engineers, Inc. identified a capacity for the three springs of 185,000 gpd (128.5 gpm). This capacity was measured in the fall of 1967 following "one of the driest summers on record."

Recent observations at the large springs indicate the flow characteristics have changed. The flow from the large springs is now approximately 90 to 95 gpm. The plant operator has noted this change and it is visually apparent at the intake structure that less water is available.

Given the information in the previous studies, and recent observations, the City should be able to rely on minimum yields for the Large and Small Springs of about 90 and 20 gpm, respectively. This translates to a total daily yield of 158,000 gpd. Since the Large Spring has provided a dependable supply of water for 75 years, clearly it should be able to continue as one of the City's main sources on a long-term basis. The Small Springs also have been used by the City for an extended period and are likely to be equally reliable as a long-term source. The decrease in flow this past summer at the large springs could be related to the recent logging in the area or possible below ground movement altering the flow paths.

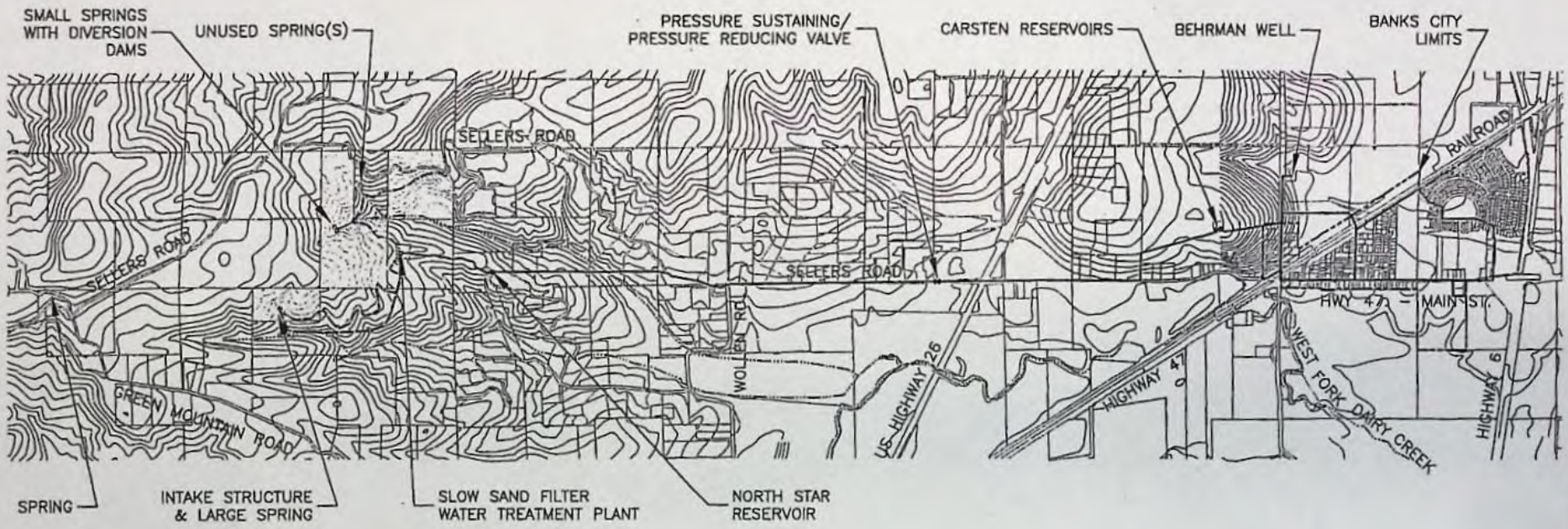
Groundwater Supply. The Behrman Well is operated during the summer months to allow the system to meet peak seasonal demands. In 1998, the well was placed into service during June; however, the City's records indicate that the heaviest use occurred from July through September. Nearly 24 million gallons of water was withdrawn from the well during those three months.

The City has reported that the existing well pump is designed to produce a flow rate of 250 gpm; however, records of the pump design data have not been located. The City added new telemetry and meters in 2000, prior to that time the production records were not consistently monitored. If the pump was consistently discharging at 250 gpm, the estimated production rate, the average daily running time during 1998 was as follows:

July	-	14.4 hours per day
August	-	21.9 hours per day
September	-	15.6 hours per day

Even though the above operating durations are approximate, it is clear the City must rely heavily on the well to meet peak demands. Typically, maximum daily running time of 18 hours is recommended for operating reliability, except in emergencies.

The City has not historically needed to operate the well as extensively as it has over the past two summers. Therefore, it is difficult to assess the long-term reliable yield. If the well continues to be used seasonally, the current production capacity may be sustainable. However, population growth may force the well to be used for a longer period each year. Also, average-operating durations above 18 hours per day for one to two months each year could reduce well yield.



LEGEND

- STREAM
- TREATED WATER MAIN
- RAW WATER MAIN
- PROPERTY LINE
- CITY OF BANKS PROPERTY
- CITY LIMITS
- CONTOUR (40')
- SPRING LOCATION
- ACCESS ROAD
- RESERVOIR

2000' 0 1000' 2000'

SCALE 1" = 2000'

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WATER MANAGEMENT AND CONSERVATION PLAN
WATER SYSTEM MAP
CITY OF BANKS, OREGON

FIGURE 2-1

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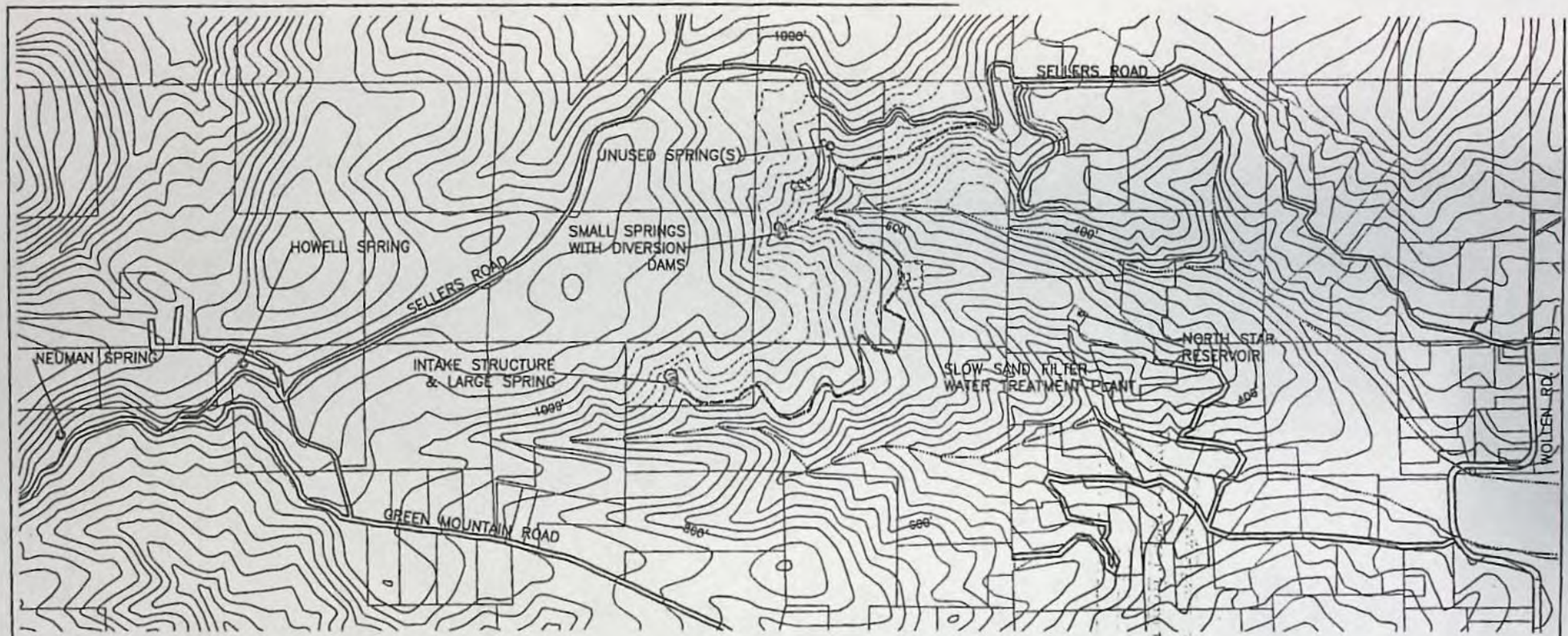

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WATER MANAGEMENT AND CONSERVATION PLAN
SURFACE WATER SOURCE AREA MAP
CITY OF BANKS, OREGON

FIGURE 2-2

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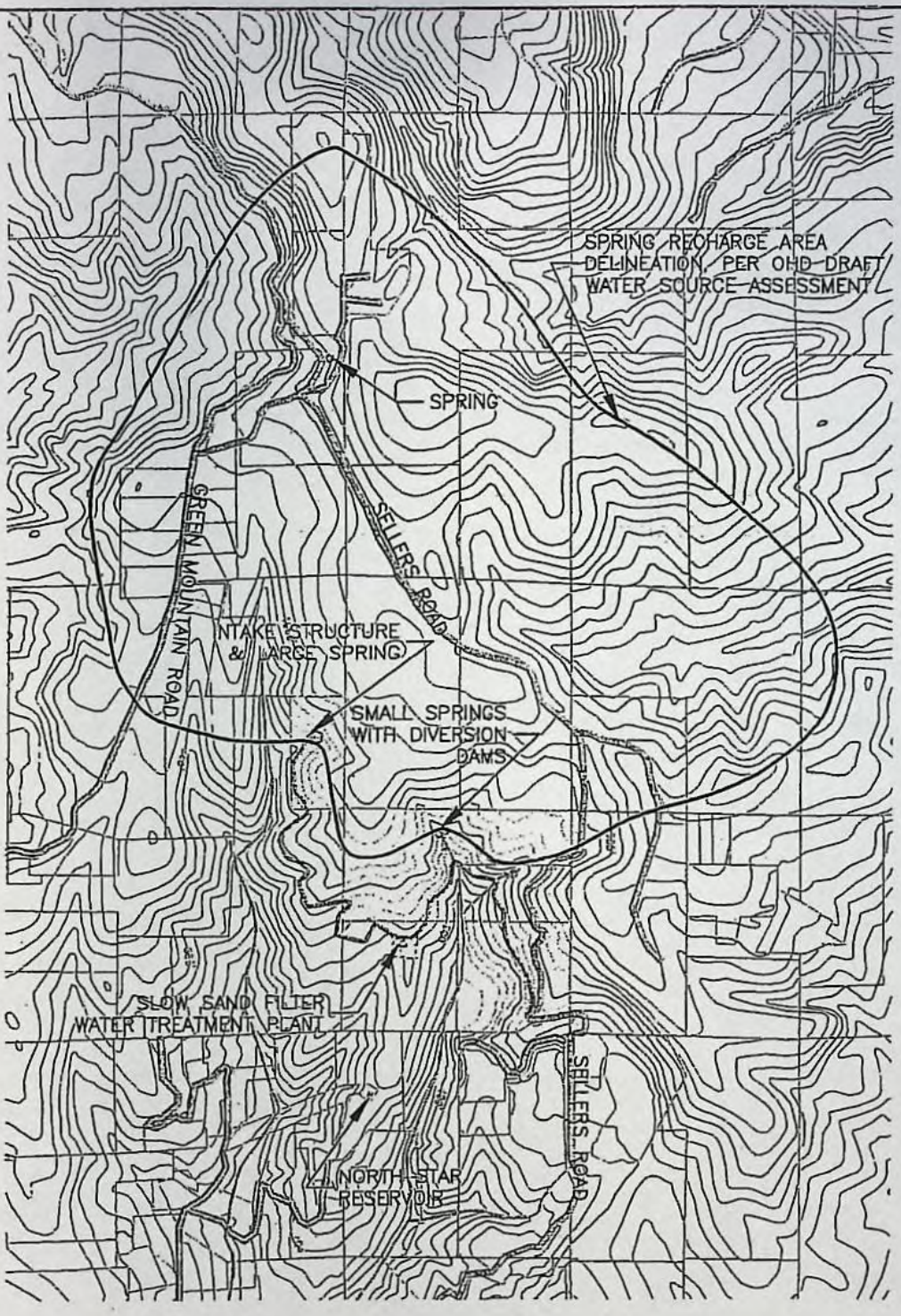

LEGEND

- STREAM
- ROAD (MAIN)
- ACCESS ROAD
- LOT LINE
- CITY OF BANKS PROPERTY
- CONTOUR (200')
- CONTOUR (40')
- SPRING LOCATION
- SPRING RECHARGE AREA PER DRAFT OREGON HEALTH DEPTARTMENT SOURCE WATER ASSESSMENT

2000' 0 1000' 2000'

SCALE 1" = 2000'

WATER MANAGEMENT AND CONSERVATION PLAN

SPRING RECHARGE AREA
CITY OF BANKS, OREGON

FIGURE 2-3

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CITY OF BANKS
WATER MANAGEMENT AND CONSERVATION PLAN

SECTION THREE

EXISTING WATER SYSTEM

GENERAL

The bulleted items presented below provide a brief outline of the Banks water system. The major components of the system are then described in more detail in the following subsections. Recommended upgrades identified in the 1998 Water System Master Plan Update are also included in the subsections covering the affected components.

- The surface water supply is directed to customers by gravity.
- Intake structures divert flows from the springs into raw water transmission pipelines.
- Two separate transmission lines, one from the Large Spring and another from the two Small Springs, carry the raw water to the slow-sand filtration plant.
- At the treatment plant, flows pass through the two slow-sand filter basins are metered as they are discharged through the effluent piping.
- A 6-inch transmission main brings the filtered water from the plant to the 70,000-gallon North Star Reservoir. Chlorine is used for disinfection at the influent to the North Star Reservoir which serves as a chlorine contact chamber.
- A 3-mile long, 6-inch treated water transmission main runs between the North Star Reservoir and the Carsten Reservoirs just north of Banks' city limit.
- Two reservoirs are located at the Carsten Hill site. The water surface elevation in these reservoirs maintains operating pressure in the distribution system.
- A 14-inch transmission main connects the Carsten Reservoirs to the City's distribution system. The distribution system serves the entire City and small areas to the east and west of the City.
- The Behrman Well pumps groundwater into the 14-inch transmission main just upstream of its connection to the distribution system. Chlorine is also injected at the wellhead to disinfect the well discharge.
- Currently there are approximately 20 customers in the high zones of the system that are located near the North Star Reservoir that are being served at a low system pressure especially during periods of high demand

Figure 2-1 is a map that identifies the location of the system components and Figure 3-1 presents a schematic of the overall system.

INTAKE STRUCTURES

A new intake structure at the Large Springs was completed in 1997 as a replacement for the one destroyed during the February 1996 flooding. This new structure is a small dam below the spring that creates an impoundment from which a reliable source of raw water can be withdrawn. Excess water flows over a weir in the dam and into the downstream creek bed.

Two smaller concrete dams were built across the two creek beds below the Small Springs. The age of these structures is not certain; however, they may have been part of the original City water project in the 1920s. The small springs are close to each other and the resulting streams flow together to form a single creek bed less than 100 feet below the diversion dams. At this confluence the pipes that collect the water behind each structure also meet and a single pipeline continues downstream.

The intake at the Large Spring is used as the primary water source. High turbidity levels in the Small Springs limit their use to periods of dry weather. The 1998 Water System Master Plan Update did not address upgrading the Small Springs diversion system since the matter was to be evaluated as part of this study.

RAW WATER TRANSMISSION

Large Spring Transmission Pipe. The raw water supply from the Large Spring currently flows by gravity from the intake structure to the slow-sand filter plant through a 4000-foot long, 6-inch pipeline. Roughly 3,600 feet of the line is galvanized steel pipe that was part of the replacement transmission line between the spring and the City constructed in 1953. The last leg of the line is 6-inch PVC pipe installed to divert water to the treatment plant.

The old pipe has experienced multiple breaks in recent years, and is difficult to reach for repair work. The first 1,200 feet of the line runs along a creek bed and most of the remainder cuts across forest land. In addition, based on their experience with steel pipes of that age, the City believes the line leaks a significant amount of water. The 1998 Water System Master Plan Update recommended that a high priority be given to the replacement of this line with a new 8-inch pipe. A new pipeline will reduce time spent on repairs, and will provide for more efficient use of the new intake structure and slow-sand filter plant due to less water loss. Figure 3-2 shows the alignment of the existing pipe and a proposed alignment for the replacement pipe. The proposed alignment should improve accessibility.

Small Springs Transmission Pipe. A 4-inch PVC pipeline was installed a couple of years ago to replace the old asbestos cement pipe that had served the Small Springs diversion system. The new pipe runs southward along the creek bed below the springs to the plant access road. The pipe then follows the road in a southwesterly direction to the plant site. The line is about 1,500 feet long.

TREATMENT PLANT

The water treatment plant was completed in 1997 to provide filtration for the diverted spring water in compliance with the Federal Surface Water Treatment Rule. The plant consists of two slow-sand filter basins, each having a surface area of approximately 1,600 square feet. A pipe gallery structure adjacent to the effluent end of the filter basins houses the process control piping. A flow meter located at the outlet was connected to the new telemetry system in the early 2000, and provides a measure of the flow into the system.

The plant is manually operated except for a control valve in each filter effluent line that automatically restricts the flow rate through each basin. Flow control valves were designed to limit the throughput to 100 gpm per filter, which results in a maximum filter loading rate of 0.06 gpm per square foot. This is a conservative loading rate and early performance indicated that the filters could treat a higher flow rate without compromising finished water quality. Therefore, the City could change the inserts in the valves to accommodate a flow of about 150 gpm through each basin. The resulting hydraulic loading rate of 0.09 gpm per square foot is still within the typical range for slow-sand filter loading in Oregon.

The 1998 Water System Master Plan Update recommended the addition of a third filter basin to increase plant capacity. This would allow up to 300 gpm to be treated with one basin out of service. Thus, the City could use the flow from the springs more efficiently when flow rates are high. Additional water rights would also need to be obtained from the Water Resources Department.

TREATED WATER TRANSMISSION

Existing Transmission Main. Treated water flows from the slow-sand filter plant to the North Star Reservoir through a 1,800-foot, 6-inch PVC transmission main. Segments of this pipeline were replaced in conjunction with the treatment plant construction.

A 15,300-foot, 6-inch galvanized steel transmission main installed in 1953 carries the treated water from the North Star Reservoir south to the Carsten Reservoirs site. The pipe alignment cuts across an undeveloped area to Sellers Road and then along that road

to about 3,000 feet north of Banks Road. At that point the line turns east and extends up the hill. The portion of the line north of Sellers Road is about 4,200-feet long and crosses a wooded drainage swale. Figure 2-1 shows the transmission main alignment.

There are over 70 customers that are connected to this pipeline. Most live along Sellers and Woollen Roads, but a few connections serve homes to the east of Sellers Road on Palace Drive and Covey Lane. A pressure sustaining/pressure-reducing valve (PSV/PRV) has been installed in the line about 1,000 feet north of Sunset Highway (U. S. Route 26). This valve is set to maintain adequate operating pressure for upstream customers and eliminate excessive pressure for downstream customers. The service connections between North Star and the PSV/PRV are, therefore, part of a separate pressure zone that is commonly referred to as the High Zone.

The transmission main between the North Star and Carsten Reservoirs is in need of replacement for the following reasons:

- The pipeline is old and is believed by the City to leak extensively; and
- The pipeline and PSV/PRV cannot deliver more than about 90 gpm to the main zone, thus preventing full utilization of the treatment plant's capacity.

Replacement of Transmission Main

The 1995 and 1998 Water System Master Plans proposed that two pipelines be installed to replace the existing transmission main. One line would extend from the North Star Reservoir down at least to the location of the PSV/PRV and would provide separate service to the High Zone. The other line would extend to the Carsten Reservoirs and would not include any PSV/PRV along its route. Deleting the PSV/PRV would allow the entire capacity of this second transmission main to be used to serve the City. Flows to the City would be controlled by the altitude valve at the Carsten Reservoirs.

The 1998 Water Supply Master Plan Update recommended that the alignments for both replacement pipelines follow the path of the existing transmission main (see Figure 3-3). This represents the shortest route and would result in the lowest construction costs.

The 1998 Water Supply Master Plan Update recommended that the location of the terminus for the separate high zone transmission main be investigated during preliminary design. The portion of the main zone along Sellers Road between Highway 26 and Banks Road could be served by an extension of the high zone transmission main. However, a PSV/PRV would probably be needed to avoid excessive service pressures south of

Highway 26. Conversely, it may be feasible to serve most or all of this area as part of the main zone by running a parallel main line north from the Carsten Reservoirs.

PRODUCTION WELL

Description. The City constructed the Behrman Well in 1979 to supplement its surface water supplies. The approximate location of the well is identified in Figure 2-1. Section Two briefly describes the source water tapped by this facility.

The wellhead facilities are housed in a small building and consist of the well pump motor, associated piping and valves, chlorination equipment, and controls. The current pump was installed within the last five years and is controlled automatically based on the water level in the Carsten Reservoirs. The City's telemetry system signals the pump controls to start and stop the pump at preset minimum and maximum water levels in the reservoirs. The production flow rate is measured by a flow meter in the discharge piping. Chlorination equipment disinfects the water by withdrawing chlorine gas from 150-pound cylinders and injecting it into the pump discharge under vacuum. Table 3-1 presents data for the well.

Table 3 - 1
Data For Production Well

Well Parameter	Value
Total Depth (feet)	450
Well Casing Depth (feet)	210
Well Casing Diameter (inches)	8
Design pump capacity (gpm)	250

The recent replacement of the well pump has upgraded the reliability of the production well. In addition, the upgrade to the telemetry system installed in early 2000 should further improve well operation. The expansion of the telemetry and monitoring system includes the ability to automatically measure flow production and to measure groundwater levels. This allows well drawdown to be monitored for changes and long-term trends. Future upgrades to the site should include the replacement of the chlorination equipment, and the possible addition of a chlorine scrubber depending on the type of equipment installed.

It is typical practice to rate the capacity of a well by assuming a maximum pump operating time of 18 hours per day. Limiting the hours of operation increases reliability by reducing equipment wear and providing more opportunity for preventive maintenance. Operating the well for 18 hours at 250 gpm results in a maximum capacity of 270,000 gpd.

STORAGE

North Star Reservoir. The North Star Reservoir was constructed in 1981 to provide chlorine contact time for disinfection and storage capacity for the high zone customers. Before the construction of the treatment plant it also removed some turbidity. The 70,000-gallon concrete tank has a diameter of 30 feet and a side water depth of 14 feet.

Chlorination equipment was installed at the time the tank was built to inject gaseous chlorine into the inlet pipe. Chlorine gas is stored in 150-pound cylinders and injected under vacuum. A chlorine residual analyzer measures chlorine content at the outlet and can be remotely monitored through the telemetry system.

The 1998 Water System Master Plan Update recommended that 300,000 gallons of storage capacity be provided in the high zone. That report proposed that a single new tank be constructed at the existing filtration plant site and the North Star Reservoir be abandoned. Consolidating the storage and treatment facilities would simplify operations and maintenance and allow the operating water surface elevation in the storage tank to be raised. The high zone would then operate at a higher hydraulic grade line (system pressure).

The new storage tank would need to have a water surface elevation no higher than approximately 665 feet to allow it to be fed by gravity from the slow-sand filters. The floor of the tank would, therefore, need to be well below the level of existing grade on the site. The operating level of the new tank could be as much as 100 feet higher than the water surface in the existing tank. Currently operating pressures in the high zone north of the PSV are quite low for many homes served in that area. Therefore, the increase in system pressure will improve service for some customers. Other users may, however, experience excessive pressures due to the higher tank elevation. This issue will be addressed during the design of the reservoir and transmission main improvements.

The 1998 Water Supply Master Plan Update also recommended that the existing chlorination facilities at the North Star Reservoir site be abandoned. New chlorination facilities would be located at the plant site and the new reservoir would then provide chlorine contact time to meet disinfection requirements.

Carsten Reservoirs. The site of the Carsten Reservoirs is about 1,000 feet north of Banks Road and 800 feet east of Sellers Road. There are two welded-steel tanks at the site with capacities and dimensions as shown in Table 3-2.

Table 3 – 2
Data For Carsten Reservoirs

Parameter	Tank No. 1	Tank No. 2
Year Construction Completed	1994	1999
Tank Capacity (million gallons)	0.5	1.0
Diameter (feet)	60	81
Depth below overflow (feet)	24	26.5
Tank floor elevation (feet)	390	388

The tanks typically operate in series with flows passing first through Tank No. 1 and then Tank No. 2. A single altitude valve controls the flow into the tanks from the treated water transmission main. The altitude valve keeps the tanks full by opening to allow the inflow of water whenever the level in the tank drops. When flows from the North Star reservoir are not sufficient to keep the Carsten Reservoirs full, then the production well is started. The reservoir levels are remotely monitored through the telemetry system.

DISTRIBUTION SYSTEM

Figure 3-4 presents a map of the water distribution system for Banks. The system provides service to all residents within the City limits and also extends to the east of town along Banks Road and to the west along Cedar Canyon Road.

Major expansions to the system have been installed over the last two years to serve development in South Banks and increase system reliability. A 12-inch water main loop was constructed in 1997 to the east of the Banks Lumber Company between Banks Road and the railroad tracks. The main connects with the water line under Sunset Avenue after crossing the railroad right-of-way and then extends southeast along the railroad to the new development in South Banks. This main added redundancy to the single 14-inch water main that runs through town beneath Main Street. Also, about 8,000 lineal feet of 8-inch distribution piping has been added in the new developments to serve those customers.

An inventory of the distribution system piping is listed in Table 3-3. The 14" pipe would generally be considered a transmission main, but there are services connected to the pipeline so it has been included in the distribution system inventory.

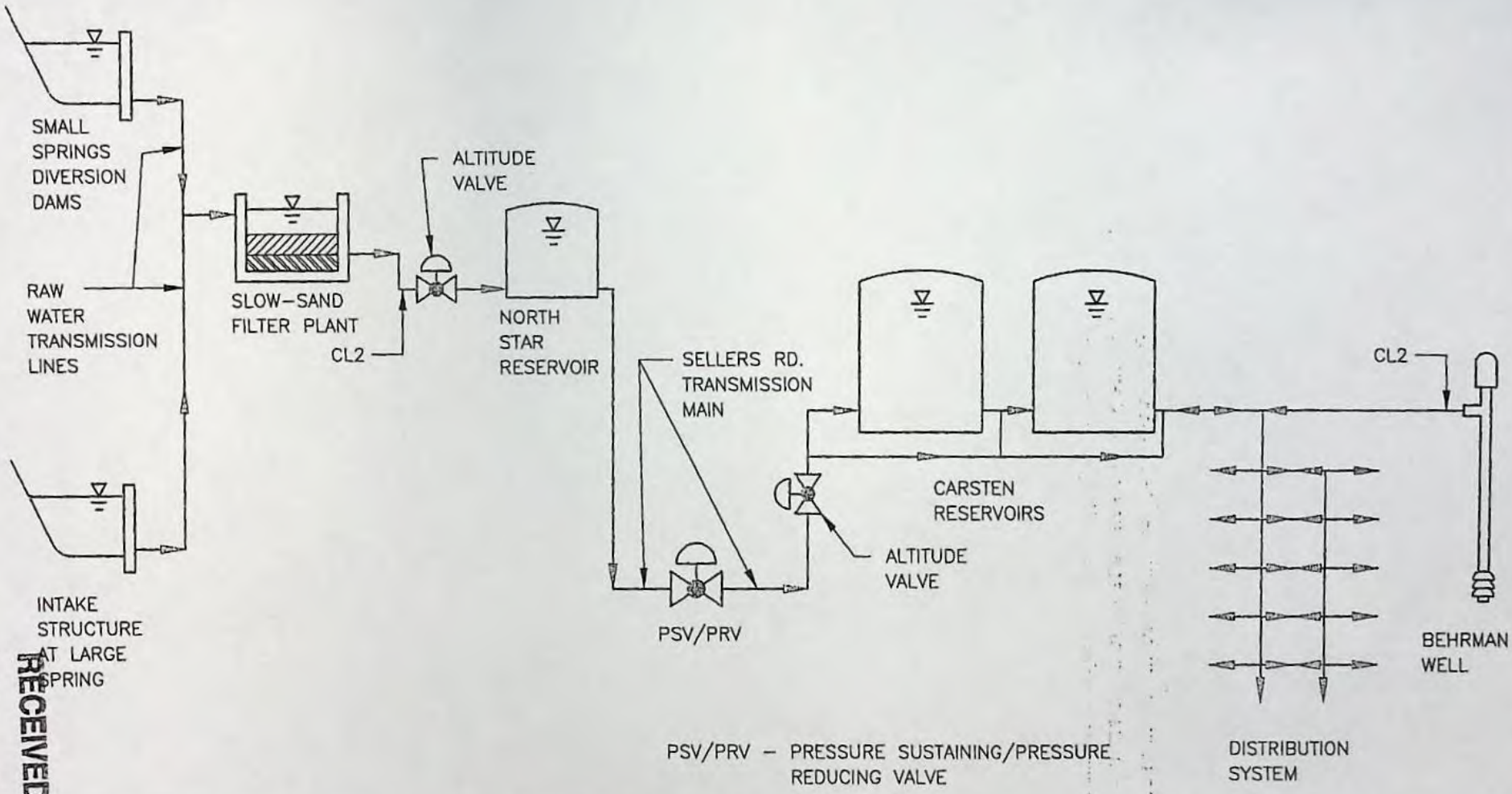
Table 3 – 3
Existing Distribution System
Pipe Inventory

Pipe Size (inches)	Length (feet)	Material
2"	3900	Steel
6"	5400	Steel-PVC
8"	9900	Ductile Iron
10"	700	Ductile Iron
12"	8900	Ductile Iron
14"	4700	Ductile Iron

Most of the galvanized steel pipes are old and can be expected to suffer from corrosion. One section along Sunset Avenue, that leaked badly, was replaced in 1996.

RECOMMENDATION

The City should plan to gradually replace the other sections of steel pipe to maintain system integrity and control leakage.

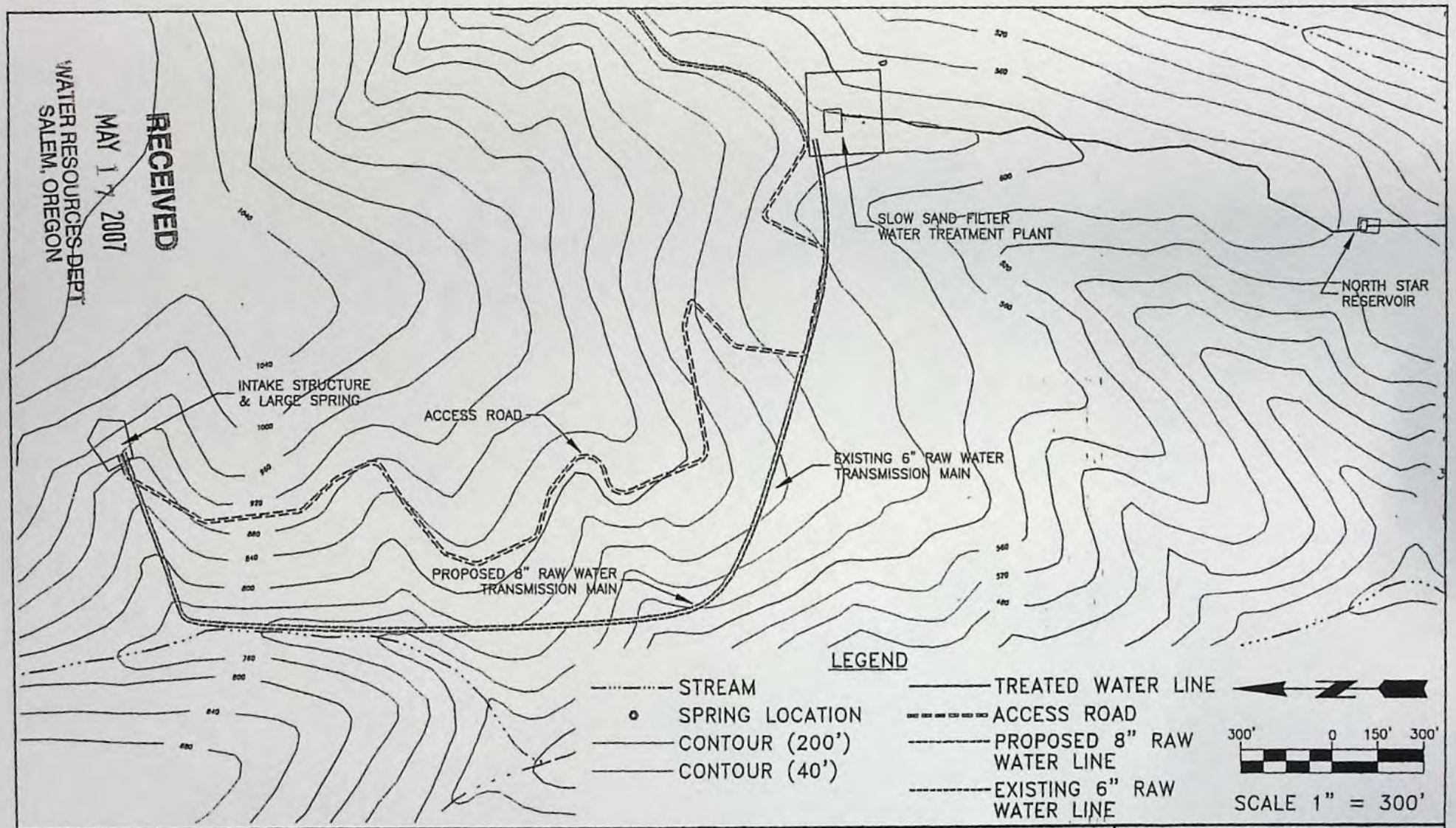


LDC Design Group Inc.

WATER MANAGEMENT AND CONSERVATION PLAN
SYSTEM SCHEMATIC
CITY OF BANKS

FIGURE 3-1

2598schematic.dwg 1-23-01

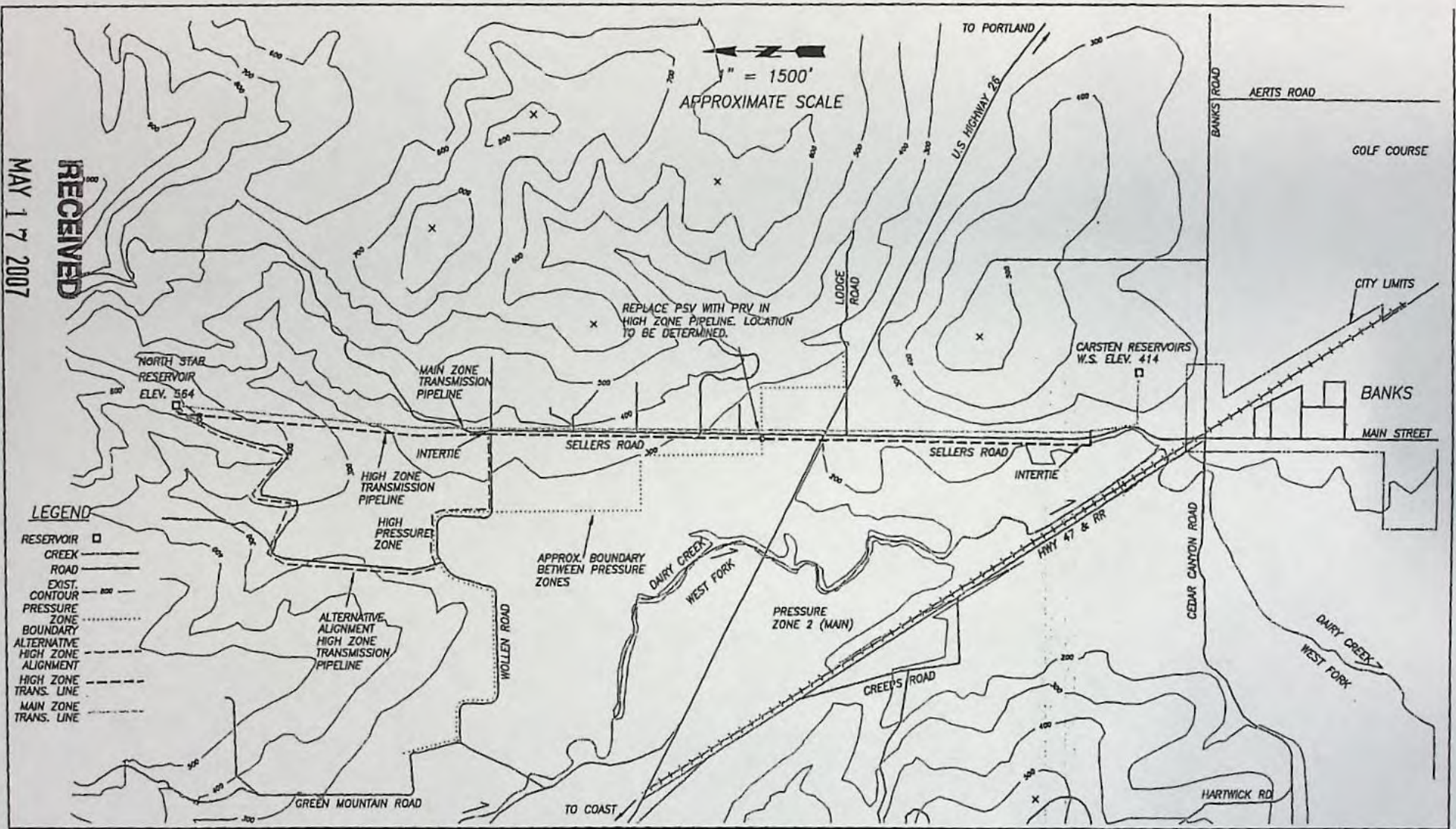


LDC Design Group Inc.

WATER MANAGEMENT AND CONSERVATION PLAN
RAW WATER TRANSMISSION MAIN
CITY OF BANKS, OREGON

FIGURE 3-2

2598rawwater.dwg 1-23-01

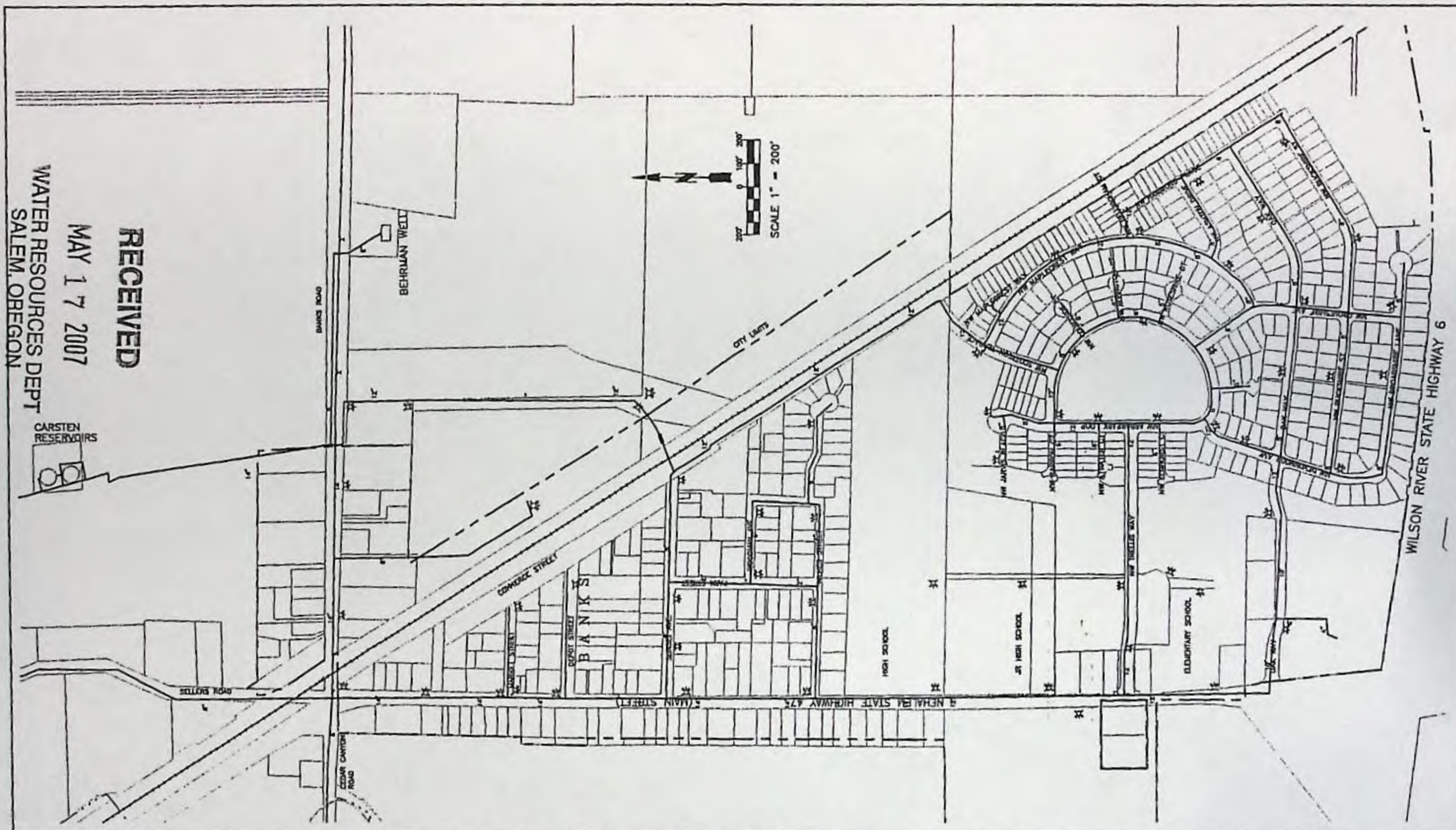


LDC Design Group Inc.

WATER MANAGEMENT AND CONSERVATION PLAN
PROPOSED TREATED WATER TRANSMISSION MAINS
CITY OF BANKS, OREGON

FIGURE 3-3

2598irwater.dwg 1-23-01



LDC Design Group Inc.

WATER MANAGEMENT AND CONSERVATION PLAN
DISTRIBUTION SYSTEM
CITY OF BANKS, OREGON

FIGURE 3-4

2568distribution.dwg 1-23-01

CITY OF BANKS
WATER MANAGEMENT AND CONSERVATION PLAN

SECTION FOUR

POPULATION AND WATER USE

POPULATION

Recent Population Trends Inside the City. Banks has been experiencing rapid growth during the last few years due to the construction of the Arbor Village and South Banks Estates developments. Table 4-1 presents recent population figures obtained from the Portland State University Center for Population Research and Census.

Table 4 – 1
Recent Population Figures

Year	Population	Annual Pct. Growth
1990	563	----
1995	575	0.42% **
1996	570	- 0.87%
1997	625	9.65%
1998	845	35.20%
1999	1310	55.03%

** Average annual growth over five-year period.

Housing construction has continued at a strong pace during late 1999 and early 2000 and the population most likely topped 1,500 during 2000. The rapid growth since mid-1997 could cause a significant shift in demographic characteristics within the City, which may, in turn, affect water use patterns. This issue will be discussed later in this Section.

Current Population Served Outside the City. As described in Section Three, Banks has in the past extended water service to customers living outside the City. The 1998 Water System Master Plan Update estimated the outside residential population served by the City to be 308 people. This figure was based on 88 residential connections with an average of 3.5 people per connection.

Population Projections. The City has been undergoing a periodic review of their Comprehensive Plan during 1998 and 1999. Through this process an interim population projection of 1,882 residents has been identified for Banks by the Year 2020, continuing under the same assumptions in 2025 the projected population would be 1,954. The projection is considered an interim figure since Washington County will be preparing an updated regional forecast next year. To identify population figures for the intervening years it was assumed the currently approved housing developments will be completed by 2005. It has also been assumed that a constant growth rate would occur from 2005 to 2025. The average annual growth rate works out to be about 0.75 percent. Table 4-2 lists the interim population projections for the City based on the above criteria.

Table 4 - 2
Population Projections for City

Year	Interim Population Projection
2005	1,680
2010	1,745
2015	1,812
2020	1,882
2025	1,954

The City has adopted a policy of not approving any more connections outside the City limits. Therefore, the 1998 estimate of 308 for the population served outside the City is not projected to change significantly.

PAST WATER USE

Total Recent Water Demands. To update estimates of per capita water use, monthly water sales records were obtained from the City for the years of 1996, 1997, 1998 and 1999. Total annual metered consumption for these years is listed in Table 4-3 along with the corresponding figures for total and per capita average daily consumption. The per capita figure is based on the total populations served inside and outside the City and total metered demand.

Table 4 - 3

Recent Total Water Consumption

Year	Total Metered Water Use (gallons)	Average Daily Water Use (gallons/day)	Average Per Capita Use (gallons/day)
1996	40,850,000	111,610	127
1997	41,620,000	114,030	122
1998	53,160,000	145,650	126
1999*	64,300,000	176,160	109

* 1999 water use was limited for a few days during August to facilitate filling of the second Carsten Reservoir. Additionally, some water use records had to be eliminated due to irregularities in use. Therefore, the Total Metered Water Use for 1999 may be low.

During the three-year period from 1996 through 1998, the overall average per capita water use was approximately 125 gallons per day. During 1999 this amount dropped to 109 gallons per capita day. The greater than 10% drop in per capita water use is difficult to explain, and could be due to a variety of factors including changes in the system demographics, errors in metering of use, and more use of low water use fixtures. Since this per capita figure is based on total metered water use, it does not include an allowance for distribution system leakage or unmetered uses.

The maximum monthly per capita consumption during the same period occurred in August 1998 and was about 256 gallons per day. This is based on an estimated population inside the City of 854 and a total population served of 1,162 for August 1998. The resulting ratio of total peak monthly demand to average demand was 2.05. This is close to the 2.0 peaking factor commonly assumed for peak monthly demands in small to medium-sized communities. In the four years of records reviewed for this study, the ratio of average daily per capita consumption to maximum monthly per capita consumption averaged 1.9.

To estimate a peak daily demand the 1998 Water System Master Plan Update recommended the use of a peaking factor on the average daily demand of 2.5, which includes fire protection reserve. Using the average per capita consumption for 1996 to 1998 (125 gpcd), this would result in a per capita demand of about 310 gpcd. The inclusion of fire protection is important for sizing of system components, however the water available at the source of supply does not need to be able to meet this demand. The

peak daily demand should be met through the use of reservoirs and supply. The system supply will need to meet a peak demand greater than the monthly demand but less than the peak daily demand. A peaking factor of 2.2 has been used in this report to calculate peak water supply capacities.

Breakdown of Recent Water Use. The total per capita water use described above includes water supplied for nonresidential, as well as residential uses. The nonresidential component includes demands for commercial, industrial, institutional and major landscape irrigation uses. The Banks Lumber Company is the only industrial customer served by Banks and the school district is the only institutional customer. The lumber mill is outside the City limits, but is served by the City's distribution system.

There are about 30 commercial service connections inside the City with the largest being the Oak Village Shopping Center. The City categorizes two connections outside the City as being commercial customers.

The major landscape irrigation category consists of several connections for the irrigation systems that cover parks, parkway strips, and other landscaped areas. Much of this demand is in the Arbor Village development. These green space irrigation systems are currently the responsibility of the Arbor Village Homeowners Association. Other areas that are included in the green space irrigation category are Sunset Park and portions of the Oak Village Shopping Center. The irrigation water used by the school district is included under the school category rather than as a major landscape irrigation source. This is because the school's irrigation systems are not currently metered separately.

Table 4-4 presents a breakdown of water use by type of customer for 1996 through 1999. This includes connections both inside and outside the City. The breakdowns are listed as percentages of total water use.

Table 4 - 4
Breakdown of Water Use By Customer Type

Type of Customer	Percent of Total Water Use 1996	1997	1998	1999
Residential Inside City	38	42	49	50
Residential Outside City	24	25	19	15
Commercial Inside City	13	12	10	9
Commercial Outside City	3	2	< 1	< 1
School District	6	8	6	8
Green Space Irrigation	6	5	10	13
Banks Lumber Company	10	6	4	3
Other Metered Uses	0	0	1	1

Table 4-4 illustrates the growth in both residential and green space common-area irrigation demands inside the City since mid-1997. The irrigation demands have grown due to the significant common-area green space in the Arbor Village development. The lower percentages for commercial accounts reflect the fact that commercial development has lagged behind residential growth.

The reduced percentage for the Banks Lumber Company is due to several factors. Their total water use has apparently been understated in 1998 due to a broken meter. The bypass meter that is being used at that service connection does not accurately measure total flow through the line. Additionally, the Lumber Company has stopped using two of the four service connections with the City and has revised their water use patterns to use less and save money. Increases in residential and irrigation demands in the City also mean the Lumber Company generates a lower proportion of the total demand. The percentage given in Table 4-4 for 1996 is also inflated because of a water leak in March of that year.

The one percent for other uses in 1998 and 1999 was primarily a result of metered demand for water used during construction in South Banks. These construction uses can be expected to drop off as currently approved development progresses.

Total Water Production and Unaccounted for Water. The City has records of monthly water production for both the water treatment plant and well. Unfortunately,

some of the 1999 recorded values were estimates due to malfunctioning flow meters and 1999 data is therefore considered incomplete. Table 4-5 presents the recorded values for total water produced in 1997 and 1998 broken down by source. Production amounts before 1997 were excluded because the treatment plant did not begin producing water until late 1996.

Table 4-5 also identifies the percentage of water that was not accounted for in the water meter records for these two years. Since all service connections have meters and the fire department uses only small amounts of unmetered water, system leaks would generally be the source of lost water. One exception would be the volume used to test and flush new water lines in South Banks. This water was taken directly from the existing pipes without metering.

Table 4 - 5
Estimated Water Production and Losses

Description	1997	1998
Water Production:		
Treatment Plant (MG)	43.75	57.34
Behrman Well (MG)	8.26	24.27
Total (MG)	52.01	81.61
Metered Water (MG)	41.62	53.16
Percent Not Metered	20	35

Figure 4-1 identifies the unaccounted for water on a monthly basis by graphically comparing the amounts produced and metered in 1997 and 1998. The reported amounts in 1997 indicate an unmetered proportion that was between 14 and 26 percent in all but two months. In 1998, the estimated portion that went unmetered varied much more widely and exceeded 45 percent in four months. There were also three months during the two year period when the reported water production was less than the total amount sold. Inaccurate production estimates could explain most of the variability in losses.

A leakage rate of at least 20 percent is indicated by the overall average losses identified from the City's records. The age and material of the three-mile treated water transmission main also suggest that the leakage rate would be high. On the other hand, the losses should be significantly lower than the 40 percent leakage rate estimated in the 1995 Water System Master Plan. One reason for this is that a major leak was eliminated after that report was completed by replacing the water line under Sunset Avenue. The percentage lost can also be expected to drop as the total system demand increases and the

distribution system is expanded. The losses through the new piping should be relatively low; therefore, the system losses would generally not increase in proportion with the growth in demands.

Based on the above discussion, it is reasonable to assume the leakage rate for the system is between 20 and 25 percent. Since the new telemetry system is in service, detailed records of water production can be used to better estimate system losses.

PROJECTED WATER USE

Projected Breakdown of Water Use. To project future water use, an estimate of future average per capita water consumption was developed. This required an analysis of current and future breakdowns of water use. The following conclusions were reached regarding the breakdown of demands by customer categories. These conclusions do not take into account the conservation efforts discussed in Section Five of this report.

- **Residential Demands Inside the City.** There are two major trends that will affect residential water use inside the City. Average indoor per capita water use will tend to decline because the newer homes have more water-efficient plumbing fixtures. These homes are also more likely to have water-efficient appliances and less likely to be experiencing plumbing leaks. As approved developments progress, newer dwellings will account for a higher proportion of the total demand, resulting in lower average per capita demands.

  Conversely, the newer homes tend to use more water for outdoor landscape irrigation. This increase in outdoor demand can be high relative to the reduction in indoor demands described above. However, it occurs for only about four months during the year. Thus, the increase in annual average water use may be minor.

  To provide a conservative estimate, it has been assumed that future average per capita demands in the City will be about 85 gallons per day. This is a little lower than the average 1998 inside the City residential per capita demand of 87 gallons per day. However, 85 gallons per capita per day is conservative as it is significantly higher than the 1996 value of 76 gallons per capita day (gpcd), the 1997 value of 69 gpcd and the 1999 value of 70 gpcd.

- **Residential Outside the City.** Even without a conservation program, indoor water use will be reduced by the gradual replacement of plumbing fixtures and appliances with more water efficient units. However, the reduction will be modest. To be conservative it has been assumed that average per capita demands outside the City will not change in the future relative to current per capita demands. The average per capita demands from 1996 through 1999 were estimated to be about 89 gallons per day. Residential use outside the City has

been projected to remain constant as the City has no plans to provide additional connections outside the city.

- **Commercial Inside City.** Commercial development in the City has not kept pace with the rapid residential development since 1996. Consequently, the proportion of total demands attributed to commercial uses has dropped (see Table 4-4). The City's Growth Management Plan indicates that commercial development can be expected to increase in response to the population growth. This study has, therefore, assumed that future commercial demands in the City will make up about 12 percent of the total system demands after the Year 2005. This value corresponds to the proportion identified for 1997.
- **Commercial Outside City.** As previously indicated, the City does not plan to approve any additional water service connections outside the City limits. Commercial demands outside the City have, therefore, been projected to remain constant at 200,000 gallons per year.
- **School District.** Since the school district serves areas outside the City, enrollment at the schools has not increased in proportion with the City's population growth. Additionally, outdoor water use is not expected to increase at the schools. It has been assumed the school district will increase by 10% to year 2005 and remain unchanged from 2005 to 2020.
- **Green Space Irrigation.** No growth in green space irrigation is anticipated, as no new open space is planned. The major irrigator is the Arbor Village Homeowners Association, which is planning to use less water than in the future.
- **Banks Lumber Company.** The lumber mill has been using less water each year for the past three years. The mill does not plan to increase its use of City water in the future, therefore no growth is anticipated. For projecting future water demand, 1997 metered demand records were used as representative values.

Population growth projected to occur over the next three to five years will produce a large increase in the proportion of water used by residential customers inside the City. Using the demands projected and noted above along with projected populations, Table 4-6 summarizes the projected breakdown of future water use by customer type.

Table 4 - 6

Estimated 2005 Breakdown of
Water Use By Customer Type

Type of Customer	Percent of Total Projected Use
Residential Inside City	61
Residential Outside City	12
Commercial Inside City	12
Commercial Outside City	<1
School District	6
Green Space Irrigation	6
Banks Lumber Company	2

Total Projected Water Use. In 1999, the average daily demand was 176,160 gallons per day. The demand will quickly grow as the developments are completed and then moderate after 2005. Using the demands projected and noted above along with projected populations, Table 4-7 summarizes the projected water consumption in Banks. An average daily demand to peak demand ratio of 2.2 is estimated which is greater than the average monthly demand to peak monthly demand ratio over the past four years of 1.9.

Table 4 – 7

Projected Water Consumption

Year	Avg. Daily Demand (gallons/day)	Peak Demand (gallons/day)
2005	235,000	517,000
2010	242,000	533,000
2015	250,000	550,000
2020	258,000	568,000
2025	266,000	585,000

Projected Water Production Requirements. Required water production is greater than the metered water consumption, as previously noted in this section. In 2005, the new home construction in the south Banks area is expected to be complete and the system-wide loss rate is estimated to be 20 percent. Over time, the loss rate should decrease as older lines and meters are replaced. The amount of unaccounted for water should approach 10 percent, which is typical for a good water system. Projections of total water production requirements, summarized in Table 4-8, use the system demands shown in Table 4-7 plus a 20 percent loss in 2005, a 15 percent loss in 2010 and 10 percent losses in the following years.

Table 4 – 8

Projected Water Production Requirement
(Consumption & Loss)

Year	Avg. Daily Demand (gpd)	Peak Demand (gpd)
2005	293,000	645,000
2010	285,000	627,000
2015	278,000	612,000
2020	287,000	632,000
2025	295,000	650,000

SYSTEM SUPPLY AND DEMAND

System Supply Capacity. In Section 2, the existing water sources of supply were discussed. The supply consists of three sources; the Behrman Well, the Large Green Mountain Springs and the Small Green Mountain Springs. Their contribution to the system is summarized in Table 4-9.

Table 4 – 9

Water Supply at Minimum Flows

Source	Production (gpm)	Production (gpd)
Behrman Well (18hrs usage)	250	270,000
Large Green Mountain Springs	90	129,000
Small Green Mountain Springs	20	29,000
TOTAL		428,000

The well has been assumed to run a maximum of 18 hours per day. Although the well pump could run longer, reliability decreases with increased run times.

System Supply Capacity Deficits. Using the numbers summarized in Tables 4-8 and Table 4-9, the system supply capacity will not meet projected peak demands due to use and loss. It is projected that in the year 2005 the City supply will be 217,000 gallons per day below demand. The system supply capacity versus demand over time is summarized in Table 4-10.

Table 4 – 10

Projected System Supply Capacity

Year	Supply less Peak Demand (gpd)	(gpm)
2005	-217,000	-150
2010	-199,000	-138
2015	-183,000	-127
2020	-204,000	-141
2025	-222,000	-154

The changes in the supply capacity deficit over time are due to assumptions regarding the system wide loss rate and projected population increases. Currently, the system supply

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WATER MANAGEMENT AND CONSERVATION PLAN

METERED USEAGE VS. WATER PRODUCTION

CITY OF BANKS

FIGURE 4-1

259Busechart.dwg 1-23-01

CITY OF BANKS
WATER MANAGEMENT AND CONSERVATION PLAN

SECTION FIVE

WATER CONSERVATION

GENERAL

Water conservation can function as an important tool in helping the City use its existing and future water supplies more efficiently. Historically, water management planning has concentrated on the development of new water supply projects or an expansion of existing facilities to meet increasing customer demands. Under current State policy, the emphasis has now been shifted to place greater importance on water conservation as an alternative source. For Banks, this approach can potentially increase system reliability, reduce capital expenditures on future water supply improvements and limit impacts on local aquifers.

Rapid population growth has increased the City's use of the Behrman well during the summer. Conservation could reduce dependence on groundwater supplies and, as a result, improve the reliability of the water system. Additionally, peak daily demands are projected to exceed supply capacity and current supply plans rely on reservoir drawdown to meet these daily peaks. Therefore, conservation could increase reliability by maintaining larger volumes of stored water during periods of high use. Conservation could also reduce the cost of future expansions in supply capacity.

EXISTING MEASURES

Conservation Efforts. Previous to the year 2000, the City of Banks had not previously had a Water Conservation Plan prepared. The City adopted a comprehensive conservation program in September of 2000. All service connections in the system are required to have water meters and customers pay a unit price for all water used above a base amount of 400 cubic feet per month. This provides some financial incentive to limit water use.

Efficient water use is supported by the fact that a high proportion of the homes in Banks are part of the Arbor Village/South Banks developments. Once these approved developments are completed, approximately 70 percent of the dwelling units in Banks will have been constructed since 1995. Revisions to the 1992 Oregon Plumbing Code require that low-flow showerheads and toilets be installed in new developments. Consequently, average per capita demands for these uses is probably declining as more new homes are being occupied.

Increased water use efficiency can also be expected due to the remodeling of one existing school and the construction of another over the last two years. These buildings include low water use plumbing fixtures that comply with the 1992 Plumbing Code revisions.

The Columbia-Willamette Conservation Coalition has embarked upon a conservation program for the Portland metropolitan area. Although Banks is not a member of the Coalition, media campaigns and workshops conducted by that organization may also be reaching the City's customers.

System Leakage. The Water Management and Conservation Plan identifies an estimated system-wide leakage rate in the range of 20 to 25 percent. As a comparison, the 1995 Master Plan Update estimated the overall leakage rate at about 40 percent. This drop can be attributed to the repair of a leaking water line and the installation of new piping in South Banks. The City plans to further reduce losses by replacing the treated water transmission main between the North Star and Carsten Reservoirs. The timing of this project depends on identifying a funding source to help cover construction costs.

ALTERNATIVE CONSERVATION MEASURES

General. Commonly employed conservation measures have been evaluated as part of this Plan to identify those that are appropriate for a conservation program in Banks. The conservation measures that were considered here generally fall within the following three broad categories:

- those that consist of educational or administrative measures designed to modify water-use behavior patterns; and
- those that include the installation of devices, equipment or materials that reduce the flow of water or require less water; and
- those that shift irrigation uses for major irrigators from treated water to another source.

Conservation efforts can be viewed as passive or aggressive in nature. Encouraging the installation of water-saving technologies through public information and education would be an example of a passive approach. An ordinance that requires water-efficient devices in new developments would represent an aggressive measure.

The review of conservation measures for this Plan has drawn heavily from the following two reports that were prepared for the Portland Metropolitan Area Water Providers:

- *Conservation Measure Technology Profiles* (Barakat & Chamberlin, Inc.; 1994).
- *Conservation Program Descriptions* (Barakat & Chamberlin, Inc.; 1995).

Assumptions of costs and water savings in those previous studies were used to evaluate each measure where appropriate.

Screening Process. A two-stage screening process was undertaken during this study to identify the most suitable measures for a conservation program in Banks. An initial review of the measures identified in the above-referenced reports was conducted to eliminate those not well suited for this application. The criteria used for the initial review generally were as follows:

- level of public acceptance and political feasibility;
- the level of technology development;
- the potential for water savings, particularly peak demands; and
- the reliability of savings.

Measures that were previously screened out in the above-listed reports for the Portland metropolitan area were not considered for this study. This is because the reasons identified in those previous reports for rejecting those options also apply to Banks.

During the second stage of the screening process, LDC Design Group, Inc. conducted a more detailed evaluation of the measures that passed the initial review. This phase involved evaluating these measures specifically for a conservation program in Banks.

The screening process completed for this Plan placed an emphasis on measures that reduce outdoor water uses. People tend to be more flexible in outdoor water-use patterns and, therefore, more responsive to conservation efforts. Additionally, such uses may be increasing in Banks as new homes are constructed. Opportunities for reductions in indoor water use are limited because so much development has occurred in Banks after the 1992 Plumbing Code revisions.

Summary of Conservation Measures. Table 5-1 identifies the conservation measures that were considered and screened out during the initial review. Several measures aimed at indoor nonresidential uses were rejected because the types of uses affected by these measures make up a low proportion of the total demands.

Table 5-1

List of Conservation Measures Discarded by Initial Review

Target Market	Measure Description
All outdoor users	• Gray water systems • Cisterns
Indoor residential	• Ultra-low flow (ULF) toilets • Toilet tank devices • Faucet aerators
Indoor commercial, industrial and institutional	• ULF urinals and commercial toilets • Automatic-shutoff, low-flow faucets • Lower-volume clothes washers • Water-efficient HVAC equipment • Industrial process optimization

Table 5-2 lists those conservation measures that were considered during the initial screening stage and identified for further evaluation.

Table 5-2

List of Conservation Measures That Passed Initial Review

Target Market	Measure Description
Public sector	• Leak detection and repair program
All customers	• Public information program • Modified water rate structure
All outdoor users	• Low water-use irrigation systems • Low water-use landscaping
Outdoor residential	• Hose shutoff devices • Soaker hoses or pipes
Outdoor nonresidential	• Water audits for major users • Shifting irrigation water use to another source
Indoor residential	• ULF showerheads • Water-efficient dishwashers

Indoor commercial and institutional	• Water audits for major users

Appendix A presents brief summaries of the conservation measures that were reviewed and evaluated as part of this report. These summaries also identify the reasons for discarding those measures that were screened out by the initial review (Table 5-1). More detailed information on these measures is provided in the previously prepared conservation reports referenced on Page 5-2.

RECOMMENDED CONSERVATION PROGRAM ELEMENTS

The main elements that were recommended for inclusion in the conservation program are described in the following paragraphs. These recommendations are provided as a starting point. Once a program has been established, periodic reviews will identify elements that should be dropped or added based on experience in Banks and elsewhere in the area.

1. **Public information and education.** This element must be developed first to serve as the foundation for the conservation program. Initial efforts should concentrate on gaining support within the community, including the school district. Coordinating these efforts with the Columbia-Willamette Conservation Coalition would help to optimize use of available resources.

   Public information materials distributed locally should initially focus on outdoor water use for landscaping. Materials that provide tips on efficient watering practices for landscape irrigation can be provided to homeowners and nonresidential users. As discussed below under program implementation, the City may want to identify specific conservation practices in a water use ordinance. Informing water customers of these voluntary or mandatory conservation measures would be part of the initial public information efforts.

   Information regarding indoor measures such as ULF showerheads and water-efficient dishwashers can be distributed as part of subsequent efforts.

2. **Water-efficient landscaping and irrigation systems.** The use of water-efficient plant materials and irrigation technologies will be promoted through public information efforts and workshops. Another aspect to this program element could potentially be a rebate program for customers who buy certain plant materials or irrigation equipment. The need for a rebate program should be assessed after initial public information efforts have been conducted. Rebate amounts should be set in coordination with other water agencies.

3. **Water audits for major customers.** It is anticipated that a contractor experienced in this activity will perform the audits. Information is likely to be available from the Conservation Coalition and other water providers that can be used in developing this program element. Coordination with other agencies could increase the effectiveness of these efforts.

4. **Retrofit of indoor residential plumbing fixtures and devices.** Public information efforts can promote ULF showerheads as low cost conservation measures in older homes. Rebate programs used by other utilities for water-efficient appliances can also be promoted. Potential cost savings for customers should be emphasized to increase acceptance.

5. **Leak detection and repair program.** The City should reevaluate water system losses after the treated water transmission main is replaced. A leak detection and repair program aimed at the older water lines in the City may be warranted to further reduce leakage. The City should also develop a formal water meter inspection and replacement program for older service connections. This should increase metering accuracy.

6. **Shifting irrigation use from treated water to another source.** The City should strongly consider shifting major commercial/industrial/institutional irrigation use from treated water to a raw water source. The benefits of this shift are two fold. The savings would benefit the City, in that the irrigation use coincides with the dry time of year. The reduction in demand for treated water would limit the need for new source development. The savings could also benefit the irrigator, as the cost of untreated water would be significantly less.

Another element that the City may wish to review after the initial development of the conservation program could be a modified water rate structure. A modified rate structure would help encourage conservation and emphasize the cost of providing system capacity to meet peak demands. A rate schedule using seasonal rates could further promote conservation during the summer. An alternative would be the implementation of a two-tiered unit cost schedule. This rate system would add a higher charge per unit sold for customers whose use exceeded a set amount. The current system of water charges does provide some incentive to limit water use as indicated by the decision of Banks Lumber Company to buy less water from the City.

WATER CONSERVATION PROGRAM IMPLEMENTATION AND COSTS

Establishment of Water Conservation Program. The water conservation program was established through a water use ordinance. Such an ordinance would authorize the

implementation of a water conservation program and endorse a policy of promoting efficient water uses.

The ordinance identified general conservation measures to be adopted such as public information efforts and regional coordination. Specific practices that should be promoted can also be identified such as preferred methods for watering turf and washing cars. The City may even want to adopt mandatory limitations on some outdoor water use from June through September. Mandatory restrictions could include:

- limiting the time of day that unattended outdoor irrigation of turf and plants can occur from the period from 8:00 P. M. to 8:00 A. M.;
- rotating days of outdoor irrigation. To further explain this process: a home with an odd number address would irrigate on odd calendar days from June 1 through September; and
- limiting the length of time that unattended outdoor irrigation can occur in each sprinkler zone to 20 minutes per day.

The water use ordinance can be combined with an ordinance that establishes the City's authority to declare water emergencies and implement a water-use curtailment plan.

Program Coordination and Administration. The implementation of a conservation program should be coordinated with conservation efforts by other water providers in the area. Administrative costs can be reduced if resources are pooled with other entities to as great an extent as possible. Similarly, efforts to promote increased water-use efficiency will be aided by efforts in other communities, as long as there is consistency in the message that is conveyed. Therefore, the City should consider joining the Columbia-Willamette Conservation Coalition to take advantage of information available from that source. Also, materials bought through the Coalition will often be lower in cost because they can be purchased in bulk.

The development of the conservation program should include the creation of a program coordinator position. For Banks this would be a part-time job that could be handled either by a City employee who would also have other responsibilities or a consultant. The coordinator position will require administrative support; therefore, the adequacy of administrative staffing must also be reviewed.

Water Savings. Some water savings will be realized when the treated water transmission main is replaced. A systematic conservation program as described above could produce an additional three to five percent reduction in the projected average demands by 2020. Peak demand reductions of 10 to 20 percent could also be realized relative to the projections for 2020. The projected demands without conservation are presented in Table 5-3 (same as Table 4-8). The estimated reductions in demand were generated from

information presented in the Portland Metropolitan Area conservation reports listed on Page 5-2.

Table 5 – 3
Projected Water Production Requirement
(Consumption & Loss)

Year	Avg. Daily Demand (gpd)	Peak Demand (gpd)
2005	293,000	645,000
2010	285,000	627,000
2015	278,000	612,000
2020	287,000	632,000
2025	295,000	650,000

Specific target reductions for Banks should be established in conjunction with established regional targets once the Conservation Program is developed. However, a target must be consistent with conditions in Banks. Opportunities for indoor water use reductions are more limited in Banks than in the overall region due to the high proportion of new dwellings. The small number of commercial and industrial customers limits the opportunities for water savings from this category of use. Target reduction must also consider the magnitude of any projected shortfall in supply capacity. In any event, the conservation program should aim for at least a 10 percent reduction in peak demands.

Table 5 - 4
Projected Water Conservation Savings

Year	Limited (10%) Conservation Peak Demand Reduction (gallons/day)	Aggressive (20%) Conservation Peak Demand Reduction (gallons/day)
2005	64,500	129,000
2010	62,700	125,400
2015	61,200	122,400
2020	63,200	126,400
2025	65,000	130,000

Tracking water use trends in the City is important to evaluating the impacts of conservation measures. As part of the conservation program, the City needs to be sure that adequate records are kept so per capita (or per dwelling) average and peak monthly demands can be tracked. This should include a breakdown of water use by class of customer because future nonresidential development could affect the overall nature of water use in the City.

Order-of-Magnitude Costs. The following order-of-magnitude estimates of probable cost were developed based on 1999 conditions. The costs of the Conservation Program would include the categories of labor, materials, and membership in the Conservation Coalition. Labor would also include general office overhead expenses and the cost of benefits. Materials include conservation related items such as pamphlets and kits that would be distributed to customers, schools and businesses. The City can buy these materials either through the Coalition or separately.

The largest proportion of the program cost would be dedicated to the conservation program coordinator and administrative support; this could be done with existing personal or a new position. Actual costs for salary, benefits and office overhead will depend on how the coordinator position is filled. The total annual labor and overhead expense would be in the range of $6,000 to $10,000. This would include time for attending Conservation Coalition meetings.

The cost share for Coalition membership is based on a formula approved by the Regional Water Supply Consortium. The number of customers that a water provider has and the average and peak demands of the system are used in the formula. The annual cost of membership for Banks would be between $1,000 and $2,000 based on information provided by the Coalition.

The type and amount of materials purchased will depend on the specific conservation efforts that are incorporated into the program. The cost for materials would generally be less than $1,000 per year.

WATER REUSE

The use of reclaimed water from an advanced wastewater treatment plant is not currently a practical option for Banks. Sewage generated in Banks is pumped to a regional wastewater treatment plant operated by the Unified Sewerage Agency (USA). Developing a water reuse system through the USA would be a regional project that would require extensive planning. Such a project would include the construction of additional treatment facilities and a system of transmission and distribution lines.

The construction of a separate water reclamation system in Banks would be prohibitively expensive unless potential large scale customers were identified. These water users would need to provide substantial funding for the project. Currently, the golf course and nearby farms do not use City water for irrigation; therefore, providing reclaimed water to these entities would not reduce system demands. Banks Lumber Company would also have no incentive to pursue reclaimed water as an option, since it can buy water from an alternative source.

The most likely uses of reclaimed water to reduce potable water consumption in Banks would be for landscape irrigation at Arbor Village, Sunset Park and the schools. The demands for these uses are not sufficient to justify the cost of an advanced wastewater treatment plant in Banks. Other issues such as gaining public support and finding a suitable plant site would produce further obstacles for water reuse in Banks.

RECOMMENDATION

Water Conservation Plan Actions

After a considerable amount of effort to research the various conservation mechanisms to arrive at what would achieve the most conservation without major lifestyle changes, we have arrived at the following list of conservation plan recommendations.

1. Begin the task of switching all large irrigation customers from treated water to a raw water source. We believe this process will require a minimum of 18 months to accomplish. Begin formal discussions with Tualatin Valley Irrigation District (TVID) and the City of Forest Grove to formally facilitate the change in source. The immediate action of the Council should be to prepare a letter of non-objection to TVID allowing the irrigation district to provide service inside the city limits. The area that can be served now is primarily all of Arbor Village and all of the School District property except the Football Field and the Ball Field east of the Football Field. By accomplishing this switch of source, the demand during the dry season of the year will drop by approximately 100,000 gallons per day. The added benefit to the switch over is that the raw water source is much cheaper.

2. It is recommended that the City of Banks go to an odd/even day schedule for outdoor irrigation for all residential and commercial customers until such time as the large irrigators can be switched to another source of supply. After the large irrigators are switched over the City should evaluate conservation needs before dropping the odd/even day watering schedule.

3. The City should switch all large irrigation customers to Monday, Wednesday and Friday irrigation schedule until the switch over of source can be placed into service.

4. Require the new Public Works/Water Superintendent position to be the Water System Conservation Coordinator for the City of Banks.

5. Require all new construction to use ULF toilets, showerheads and dishwashers.

6. Require all retrofit (remodels) plumbing fixtures to be ULF.

7. Begin July 1, 2001 to perform mandatory water audits on all commercial customers within the City of Banks.

8. Purchase and mail out bi-monthly water conservation information to each customer.

9. Purchase a supply of door hangers to advise the customer base when a conservation action is going to be taken.

If the above recommendations are placed into action the City of Banks water system should realize a reduction in demand, especially during the dry months of the year, of approximately 150,000 gallons per day. These savings should delay the need for another new source, barring a catastrophic failure of an existing source, for a minimum of 5 years.

CITY OF BANKS
WATER MANAGEMENT AND CONSERVATION PLAN

SECTION SIX

SUPPLY-SIDE WATER MANAGEMENT

GENERAL

Supply-side water management is defined as programs or actions designed to increase water supply. This is the traditional method of dealing with growth in a water system. Rapid population growth in the City of Banks has increased demand on existing sources. Demand projections, outlined in Section 4, indicate the City will require additional supplies and demonstrate the necessity for an evaluation of water supply alternatives.

With the ongoing development in south Banks, the water supply and demand situation in Banks has both near-term and long-term considerations. However, the greatest anticipated impact will occur in the near-term as the Arbor Village development is completed. A number of sources of supply options are reviewed in this section and are categorized under the general areas of near-term and long-term supply options. Each source is evaluated against the same criteria, to allow a better judgement of the feasibility of each option. The criteria include the yield, both long and short term, water quality, cost to develop, cost to maintain, feasibility issues (political, environmental, economic), permitability, time to develop and any other special factors.

Opinions of probable project costs have been developed using information available at the time this study was prepared. Finance costs of 4.3% for 20 years were used in all of the projects analyzed, which are the terms of the OEDD State Revolving Loan recently approved by OEDD. These estimates were used for project evaluation and planning while noting that final costs will depend on current market conditions, final project scope, and other variable factors.

The probable project costs presented below are considered Order-of-Magnitude Estimates, defined as having an accuracy of +50 to -30 percent under the criteria established by the American Association of Cost Estimating Engineers. These preliminary project cost estimates are current to October 2000 and include an allowance for contingencies, engineering fees, easement acquisition, and construction contract administration as noted.

NEAR-TERM WATER SUPPLY OPTIONS

General. The demand projections developed in Section 4 indicate the City must quickly look for methods to meet increased demand. The simplest way to increase supply is to fully utilize existing sources.

Green Mountain Springs

The Large Springs portion of the Green Mountain Springs watershed area are a surface water supply the City has consistently used since the 1920's. This source is already developed and an integral part of the City's water supply as noted in the Water System Master Plan and Section 2. The springs generally provide excellent quality water. Although the City's water right is for 188.5 gpm, the City has typically used a maximum of 140 gpm and the minimum flow expected from the springs is 90 gpm. The existing slow sand filter and chlorination facilities provide required treatment inexpensively.

Any effort to increase the usable yield from the springs would be difficult as the intake structure collects virtually all of the water available. Replacement of the raw water line could potentially increase the amount of water arriving at the treatment plant. The Water System Master Plan recommends replacing the raw water line leading to the water treatment plant because it is old and requires frequent repair. The age and material of the line suggest it has the potential to leak badly.

The replacement of the raw water line was recommended in the Water System Master Plan Update, in September 1998 (see Figure 3-2). The cost estimate included in the Master Plan plus inflation results in an opinion of probable project cost of $260,000. Annual maintenance on the waterline would be minimal, but annual costs should include financing and depreciation, see Table 6-1.

Table 6 – 1

Raw Water Line

Item	Cost
Project Cost	$260,000
Annual Costs	
Financing (20 years at 4.3%)	$19,650
Depreciation (50 year life)	$5,200
Operation and Maintenance	$100
TOTAL	**$24,950**

The Small Springs, also located in the Green Mountain Springs watershed area, are currently used on a limited basis. The water quality of the small springs is often highly turbid, and the slow sand filter can not adequately treat this source when turbidities are high. The City currently does not require this supply except in long periods of hot and dry weather, or in an emergency. During the long dry periods that often occur in late summer, the Small Springs are a very valuable resource.

The City has a water right on each of the small springs of 40.4 gpm for a total of 80.8 gpm. The Master Plan indicates a minimum flow of 20 gpm. It is unclear from the Master Plan and prior documents if this is total low flow available or the minimum flow for each spring. The Master Plan assumed conservatively that 20 gpm was the total available from both springs.

The high turbidities found in the small spring source water require some type of treatment prior to reaching the slow sand filter. Three general options for treatment are considered in this report: a conventional treatment plant, a flocculation basin, and an infiltration gallery. Preliminary source water "jar tests" were conducted to chemically analyze the water and assist in the determination of treatment options.

Conventional Treatment Plant The cost of a conventional treatment plant, such as a rapid sand filtration process, to treat all of the flow from the Green Mountain Springs would be prohibitive given the limited amount of water available and the condition of the raw water. The flow from the Large Green Mountain Springs is low turbidity water and does not warrant, at this time, a full conventional treatment process. Due to a lack of need for this type of treatment the benefits and costs of this type of treatment process, have not been analyzed.

Flocculation Basin Construction of a flocculation basin, consisting of flocculation, coagulation, and sedimentation is one possible option for reducing the turbidity. Flocculation is the mechanical addition of chemicals, typically alum or special polymers, which are rapidly mixed into the water and bind with the existing sediment to create flocs. The water is then slowly mixed and the flocs will coagulate into larger particles. The larger particles will then more readily settle in a clarifier or sedimentation basin.

The flocculation/clarification facility can be sized to provide reduction of the turbidity without the need to build a separate sedimentation basin (see Figure 6-1). The facility can be easily shut down, cleaned and made ready for the next season of use without a lot of expense. Costs are lowered due to the fact that power supply is already available, piping modifications will be minimal, and the flocculation equipment can be sized for the flow rates of the two small springs.

Annual maintenance and operations cost will again depend upon the amount of flocculent and length of time the equipment is in use. There will be debt service on the facility, including depreciation expense, plus labor and flocculent. The probable cost of providing a flocculation system is shown in Table 6-2.

Table 6 – 2

Flocculation System

Item	Cost
Project Cost	
Flocculator and Clarifier	$48,000
Building and Piping Changes	$20,000
Engineering	$15,000
Contingency	$12,000
TOTAL	**$95,000**
Annual Costs	
Financing (20 years at 4.3 percent)	$7,200
Depreciation (30 year life)	$3,200
Operation and Maintenance	$5,000
TOTAL	**$15,400**

Infiltration Gallery Another solution to the problem of turbidity, which will also increase the efficiency of collection of the available water, is to build an infiltration gallery to collect the water. With an infiltration gallery the water would essentially be pre-filtered as it is collected at the source. The infiltration gallery would have to be built near the two diversion structures that impound the water at present.

The gallery would be constructed of alternate layers of gravel and sand overlaying a perforated pipe gallery (see Figure 6-2). The filtered water would flow from the gallery to the Slow Sand Filter water treatment plant, in the existing pipeline, for further treatment. The water should reach the water treatment plant with lower, treatable levels of turbidity. Construction of the infiltration gallery is complicated by the need for an impounding structure to hold the water and allow time for the gallery media to work properly. The only site to utilize for a dam is relatively narrow with steep mud stone banks with the stream gradient near 20%.

An infiltration gallery must be sited to meet the hydraulic and turbidity removal requirements for the project to be a viable alternative. The hydraulic gradient necessary to continue operation of the piping and plant without pumping makes siting of the infiltration gallery very critical. Initial surveys of the site indicate gravity flow from the infiltration gallery through the plant should be feasible.

Additionally, to make the gallery stable and protected from the very turbid wet weather flows, a dam with a bypass capability would have to be constructed upstream of the infiltration gallery. A by-pass would move very turbid water, such as the flows present during the periods of heavy rainfall, around the filter. If a bypass were not built, the life of the infiltration gallery would be less than one year, as dirt and debris from the turbid water would plug the gallery media rendering it inoperable. Therefore, we strongly recommend that the infiltration gallery be built with a by-pass to extend the periods between required maintenance.

Annual maintenance for this facility could fluctuate substantially depending upon the amount of highly turbid water reaching the filters. Cleaning of the filter media will require removal of the media, as there is no feasible method to backwash the media without significant costs. The filter media would likely need to be replaced every one to three years, depending upon the amount and turbidity of the water being filtered. The probable project costs for construction and operation of an Infiltration Gallery are as follows.

Table 6 – 3
Infiltration Gallery

Item	Cost
Project Cost	
Dam Construction (with By-pass)	$65,000
Infiltration Gallery Construction	$25,000
Piping Modifications	$10,000
Engineering and Administration	$15,000
Contingency	$17,000
TOTAL	**$132,000**
Annual Costs	
Financing (20 years at 4.3 percent)	$10,000
Depreciation (30 year life)	$6,600
Operation and Maintenance	$2,000
TOTAL	**$18,600**

Additional springs are located in the general area of the Banks watershed. As a short-term option, there is a small spring or springs located approximately 600 feet east of the Small Springs. A preliminary survey to investigate the hydraulic feasibility of using these springs indicates that it is possible to move water by gravity flow to the water treatment plant. The yield of these additional springs is unknown. Initial visual observations during the summer of 1999 indicated the flow to be smaller than the Small Springs, but believed to be large enough to warrant further investigation. However, upon revisiting the springs in the spring of 2000, the water quantity had reduced to a trickle and further consideration of these springs was suspended.

Behrman Well

The City of Banks has been using the Behrman Well for approximately 20 years. The City has not historically needed to operate the well as extensively as it has over the past couple of summers. Therefore, it is difficult to assess the long-term reliable yield. In addition, the actual performance of the pump is not known, as the metering at the well site has been incomplete. An accurate measure of performance should begin as soon as possible.

The well has an associated water right of 300 gpm. The City operations personal estimate the yield to be a sustained 250 gpm. Operation and treatment costs consist of power for the pump and chlorination.

As noted in Section 2 if the pump was consistently discharging at 250 gpm, the average daily running time during 1998 was as follows:

July	-	14.4 hours per day
August	-	21.9 hours per day
September	-	15.6 hours per day

Even though the above operating durations are approximate, it is clear the City must rely heavily on the well to meet peak demands. Typically, a maximum daily running time of 18 hours is recommended for operating reliability, except in emergencies. The well operated above this recommended operation time in August 1998 and indicates the City may want to limit the daily running time of the well. Any increase in running time to meet the projected water supply demands would lower operational reliability, and is not recommended.

Recommendations The existing water system sources of supply should be the first option for the City to consider when looking for additional resources to meet projected

demands. The well and the large springs will continue to be the major sources of supply although there is little the City can do that will increase their production. In fact the City should consider limiting the use of the well as projected demand will again push average pump run times above 18 hours per day.

The first priority for the City should be to begin using the Small Springs again. It is our recommendation that the City pursue the installation of a package flocculation system for the reduction of turbidity from the small springs. This is the best near term solution for increasing the water supply.

In addition, the replacement of the raw water line from the large springs to the slow sand treatment plant is recommended. This will greatly increase the reliability of the large spring as a source of supply and reduce the leakage in the line.

LONG-TERM WATER SUPPLY OPTIONS

General. Supply side and demand side options that address the best utilization of the present water supply sources will not be sufficient to meet all of the City's water needs. Long-term water supply solutions for the City must include additional supply side options. Attempting to further stretch existing resources, including conservation, will require major lifestyle changes, as usage restrictions would need to be in place long term.

The long-term water supply options for Banks include groundwater, surface water, purchasing treated water and purchasing untreated water. Any of the sources considered in this section could be considered a third major source of supply. The long-term water supply options for the City of Banks examined herein are as follows:

1. Additional Groundwater Source
    a. New Spring
    b. New Production Well
2. Purchase of Treated Water from the City of Forest Grove
3. Purchase of Raw Water from Tualatin Valley Irrigation District (TVID)
4. Water Transfer from City of Forest Grove to TVID
5. Switching of Use-using raw water from TVID for Irrigation.

Additional Groundwater Source

Additional groundwater could come from two sources, a new production well or by obtaining water rights to utilize an existing spring near the large Green Mountain Springs.

Additional Springs Outside Watershed. Less than one mile north of the existing Large Springs is another spring with a water right dating to November 9, 1923. The water right is owned by Wilhelm and Susan Bartels and is located on property owned by Ronald and

Geogeina Howell. The water right is for the amount of 0.20 cubic feet per second or 89.7 gallons per minute. The date of the water right suggests this source is well established. After checking with the owners of the property, we find that this spring is being utilized and the owners show no interest in relinquishing any right to this water.

Approximately 0.5 miles west of the Howell Spring is a much larger spring. This spring is approximately 50 feet north of Green Mountain Road. The spring is known as the Neuman Spring.

The Neuman Spring is located approximately 1.5 miles west of the Large Green Mountain Springs. We are not sure of the year around flow characteristics of this spring. However, we have determined that a 0.20 cubic foot per second (cfs) water right does exist. We are reasonably sure that the flow from Neuman Spring does exceed this amount for most if not all of the year.

To utilize Neuman Spring would require the acquisition of the water right from the owners of the spring. It appears more than 0.20 cfs is present at the Neuman Spring. However, the water available is likely limited to the amount of the water right as this water is base flow into West Dairy Creek and could be required for fish flows.

At this point in time it doesn't appear that the water right held by the Neuman's is being used. For the benefit of being able to provide a cost and operation comparison, we have assumed that the water right would be transferable, and that a minimum of 0.20 cfs (129,260 gallons per day) would be available for use.

To move the water from Neuman Spring to the Large Green Mountain Spring Intake Structure will require pumping. A lift of 100 feet is required to overcome the elevation at the intersection of Green Mountain Road and Linklater Road. Prior to discharge of the water into the intake structure, pressure reduction will be required to avoid scouring and excessive turbulence behind the intake structure dam. We estimate that approximately 1.1 miles of 6-inch diameter pipe will be required to reach from Neuman Spring to the Large Green Mountain Springs Intake Structure. From recent observations of turbidity levels we believe the spring would be treatable by the Slow Sand Filter Water Treatment Plant.

Annual Cost for this alternative will vary depending upon the length of time that the source is utilized. We are assuming that the source will be used 120 days per year.

The determination of the feasibility of developing this site includes a variety of unknowns and questions to be considered. The water right is currently registered for private use and owned by others. The City would need to acquire the water right and change the intended

use to municipal use. The cost and timeline for such a transfer is unknown and the possibility exists that the owner would be unwilling to give the city the water right.

The spring is also located approximately 5800 feet from the existing large spring intake and would require piping to at least that point. Replacement of the existing 4000 LF raw water main was estimated in the 1998 Water System Master Plan to cost $235,000. Using the Master Plan estimate as a basis the potential cost of a pipeline for the new spring would be $290,000. However, there will be additional planning and legal costs to arrange easements for the new pipeline. The process of acquiring an easement can be a difficult and lengthy negotiation, and the costs are therefore more difficult to estimate. A breakdown of the probable project costs is given in Table 6-4.

Table 6 – 4

Additional Spring

Item	Cost
Project Cost	
Transfer Water Rights	$25,000
Easement for Pump Station, Pipeline	$15,000
Intake Structure Construction (including engineering)	$15,000
Pump Station and PRV (including engineering)	$30,000
Pipeline Construction (including engineering)	$290,000
Energy Dissipation (including engineering)	$3,000
Contingency (15%)	$57,000
TOTAL	**$435,000**
Annual Costs	
Financing (20 years at 4.3 percent)	$32,850
Depreciation (40 year life)	$10,900
Operation and Maintenance	$4,000
TOTAL	**$47,750**

Additional Well Another option is the development of a new production well. While this source might appear to be the easiest to accomplish, it is a source with a lot of risk. The risk issue is present from the very beginning, as location and siting of a production well is very difficult given the potential impact on surrounding wells, and the uncertainty of predicting the quantity of water available.

There are large numbers of wells in the vicinity of the City, the majority of which are low yielding, less than 50 gallons per minute wells for domestic use. In 1994, Squier Associates completed a hydrogeologic evaluation of the area surrounding the City of Banks. Well logs indicate there are seven wells within five square miles around Banks, which tested above 100 gpm. All of these wells produced water from the Columbia River Basalt Group aquifer.

In the time since that report was completed, a well for Quail Valley Golf Course located just east of the City was drilled. The well logs indicate the Quail Valley well could produce 300 gallons per minute (gpm). The water right associated with this well is for supplemental irrigation up to 400 gpm. However, the water right may only be used for irrigation when their primary source, Tualatin Valley Irrigation District, is not available.

The Squier report recommended a site southwest of the intersection of Wilson River Highway 6 and Highway 47 as a potential location for a new well (see Figure 6-3). This site provides reasonable spacing between large production wells already completed in the basalt aquifer to minimize hydrologic impact and well interference. This site fits the distribution system very well in that a major water main is very close and there are distinct operation advantages in having a source of supply south of the City. The well could be sited with the eventual construction of a storage tank on the south side of the City.

The development of a new production well is always problematic, as one cannot predict the sustainable yield with a great deal of accuracy. The well depth was estimated to be 800 feet. While production of a well cannot be predicted with certainty, Squire reported hydrogeologic characteristics suggest it could produce 150 – 400 gpm. Given the increasing cost of energy for pumping, the cost of operation of a production well can be more expensive than other alternatives. One distinct advantage a groundwater source will have is that it does not usually require expensive treatment costs unless the well would have major hardness problems, or other contaminant levels that would require treatment for removal. A 250 gpm well would match the approximate Behrman Well sustained production capacity and would be a good replacement for that well should it be down for maintenance or redevelopment.

The last hurdle to jump would be to obtain a water right for the proposed well. After discussions with the Oregon Department of Water Resources (ODWR), we have

determined that the lead-time to get a water right in the proposed location will be approximately eighteen months. The primary concern is the impact on other high volume wells in the immediate area. The City's ability to obtain a water right for the recommended location should be enhanced due to the fact the use is for a municipal system coupled with the water being drawn from a very deep aquifer.

The probable cost for development of a new well is shown below. While a contingency is included in the cost, this assumes there will not be appeals regarding the securing of the water right or condemnation or legal issues requiring appeal to court for final adjudication.

Table 6 – 5
Production Well

Item	Cost
Project Cost	
Drilling an 800 foot deep Production Well	$97,000
24 Hour Pump Test	$15,000
Well House, Pump, and Appurtenances	$75,000
Transmission Main (including engineering)	$135,000
Telemetry and Electrical	$20,000
Site Purchase and Improvements	$20,000
Planning, Zoning, Water Rights Permitting	$15,000
Contingency (15%)	$57,000
TOTAL	**$434,000**
Annual Costs	
Financing (20 years at 4.3 percent)	$32,800
Depreciation (40 year life)	$14,500
Operation and Maintenance	$6,500
TOTAL	**$53,800**

The development of a new production well or the development of a spring are both options that the City could develop independently. Other options for the City of Banks

include the purchase of raw or treated water from another water purveyor. The two closest water providers are the City of Forest Grove and the Tualatin Valley Irrigation District (TVID). In considering an interconnection with another water system: proximity, water availability, economic feasibility and the realization that water has become a politically sensitive issue must be clear from the outset.

Purchase from Forest Grove The Oregon Department of Water Resources encourages interconnections with other municipal supply systems. The closest municipal water system to Banks is the Forest Grove water system. The Forest Grove water system is approximately 5.3 miles south of the Banks water system along Highway 47 (see Figure 6-4). The City of Forest Grove currently has excess water rights that at present are not being used. The future growth projected in Forest Grove will over time require the water, so this source could only be considered a short-term water resource for Banks, unless Banks is able to secure dedicated water rights.

A connection between the two systems would require a new pipeline to be constructed along Highway 47. An 8-inch pipeline would be more than sufficient size to move 150 gallons per minute to Banks. A Booster Pump Station would be required to transport the water to Banks and match the water system pressure in south Banks, which is approximately 90 psi.

The construction costs for the pipeline and booster station, can be estimated using similar projects as a basis. Our opinion of probable cost for the stream crossings are the major difficulty, as the Endangered Species Act may increase the time and expense for the permitting, design and construction. The stream crossings would likely need to be bored under any stream. The annual costs are more difficult to estimate. While the financing and depreciation on a water line follow standard accounting practices, the cost of the water is unknown. The purchase of water would be subject to a negotiated contract. Such a contract would likely include a fixed yearly cost in addition to a price per gallon used. Forest Grove currently charges $1.45 per 1000 gallons for residential accounts and $1.16 for commercial accounts, plus a small ($2.76) monthly charge.

The feasibility of the whole project revolves around the willingness of Forest Grove to sell water to Banks. Forest Grove is currently conducting an assessment of their water supply and will soon enter into negotiations with the Joint Water Commission concerning their water use. Initial conversations with Forest Grove indicate they are not interested in any commitment at this time. (See Appendix A-XX)

Annual costs would also include debt service, depreciation, power costs for the pump station, and general maintenance. Our opinion of probable construction cost and annual costs are shown in Table 6-5.

Table 6 – 5

Purchase Treated Water from Forest Grove

Item	Cost
Project Cost	
28,000 feet of 8" C900 Pipe and Appurtenances	$1,820,000
Booster Pump Station	$60,000
Major Crossings	$25,000
Contingencies (Construction 25%)	$476,000
Project Administration and Engineering (35%)	$833,000
TOTAL	**$3,214,000**
Annual Costs	
Financing (20 years at 4.3 percent)	$243,000
Depreciation (40 year life)	$107,000
Operation and Maintenance	$6,000
TOTAL	**$356,000**

Purchase Water from Tualatin Valley Irrigation District

The potential purchase of water from the Tualatin Valley Irrigation District (TVID) involves several issues. These issues include; point of use, permitting, capacity, and long-term reliability. A number of agencies will need to be involved in this process, including TVID, the US Bureau of Reclamation, the Arbor Village Homeowners Association, the Banks School District and the City of Banks.

The first issue is the point of use. The water could be used for irrigation without treatment or the water could be treated for general water system supply. TVID water could serve as irrigation water for Greenville Park and all the other areas in the public domain within Arbor Village. This would eliminate the need to irrigate with treated water. Banks School District School Grounds are currently being irrigated with treated water as well. Keeping these areas green increases demands on the Banks Water System particularly during the months of July through September. Eliminating the large irrigation demands effectively conserves water for the system. The potential savings for the City water system is significant, and after recovering the initial costs, the irrigators will save money.

All of the Arbor Village Area is inside the TVID Service Area Boundary (see Figure 6-5). We strongly recommend that the City of Banks and the Arbor Village Home Owners Association pursue obtaining irrigation water for the Arbor Village Area. Since the areas being irrigated are under the jurisdiction of the Arbor Village Home Owners Association, it is primarily the responsibility of the Arbor Village Home Owners Association to pursue this issue.

A portion of the Banks School District property currently being irrigated is not in the TVID Service Area Boundary. More specifically the High School football field and baseball field are not in the service area boundary of TVID. Likewise we recommend that the Banks School District pursue the same course of action to switch to TVID water for irrigation. For the short-term, the area inside the TVID Service Area would be the best opportunity for the School District to pursue. A separate action will have to be pursued for the areas outside the TVID Service Area. The outside areas would need to be annexed to the Tualatin Valley Water District, and a water right established.

Any use of TVID water will be by contract and will fall into the category of being interruptible. The Manager of TVID has stated that while the use is interruptible they have never interrupted service to anyone except in times of system breakdown. They try very hard to work with all of their customers to maintain service.

Currently the irrigation district has a water line that leads to the east side of the Banks Lumber Company lumber mill property. The major cost in constructing the connection to the parks and school would be to bore a water line under the railroad, including permits, in addition to the rest of the water line and associated easements. The funding for this and the initiative should come from the Arbor Village Homeowners Association and Banks School District. Their costs for irrigation will drop significantly as TVID water costs approximately $0.32 per 100 cubic feet, for the first 2,000,000 gallons, versus $1.65 for City water. (The cost for TVID water does increase with increasing volumes used.)

Treat TVID Water

Another potential option for the City of Banks is to purchase untreated water from the Tualatin Valley Irrigation District. This water could then be treated and used in the water system. The purchase of water from an irrigation district for municipal use is a much more difficult process when it comes to permitting. The process will take time and a positive outcome is not guaranteed.

The costs for developing this source, outside of the permitting and legal process, would include a pipeline, a package treatment plant and possibly a small pump to boost the pressure from the plant to the water system. The connection to the TVID could be made

near the corner of Aerts Road and Banks Road. The siting of a treatment plant could be adjacent to the existing well site or near the reservoirs. Initial discussions with TVID indicate there is ample pressure in their system to site a treatment plant near the reservoirs, which would limit costly pumping of the water.

The long-term reliability and viability of this source need to be further investigated in the course of acquiring the permits for this project. The United States Bureau of Reclamation (USBR) regulates the Tualatin Valley Irrigation District. The USBR owns the water rights and their mission is to provide water for irrigators, generally farms and nurseries. The City will need to assure itself that this source will not be superceded by a new farm demand in the future. It will also need to be determined if TVID has adequate water rights to supply the City.

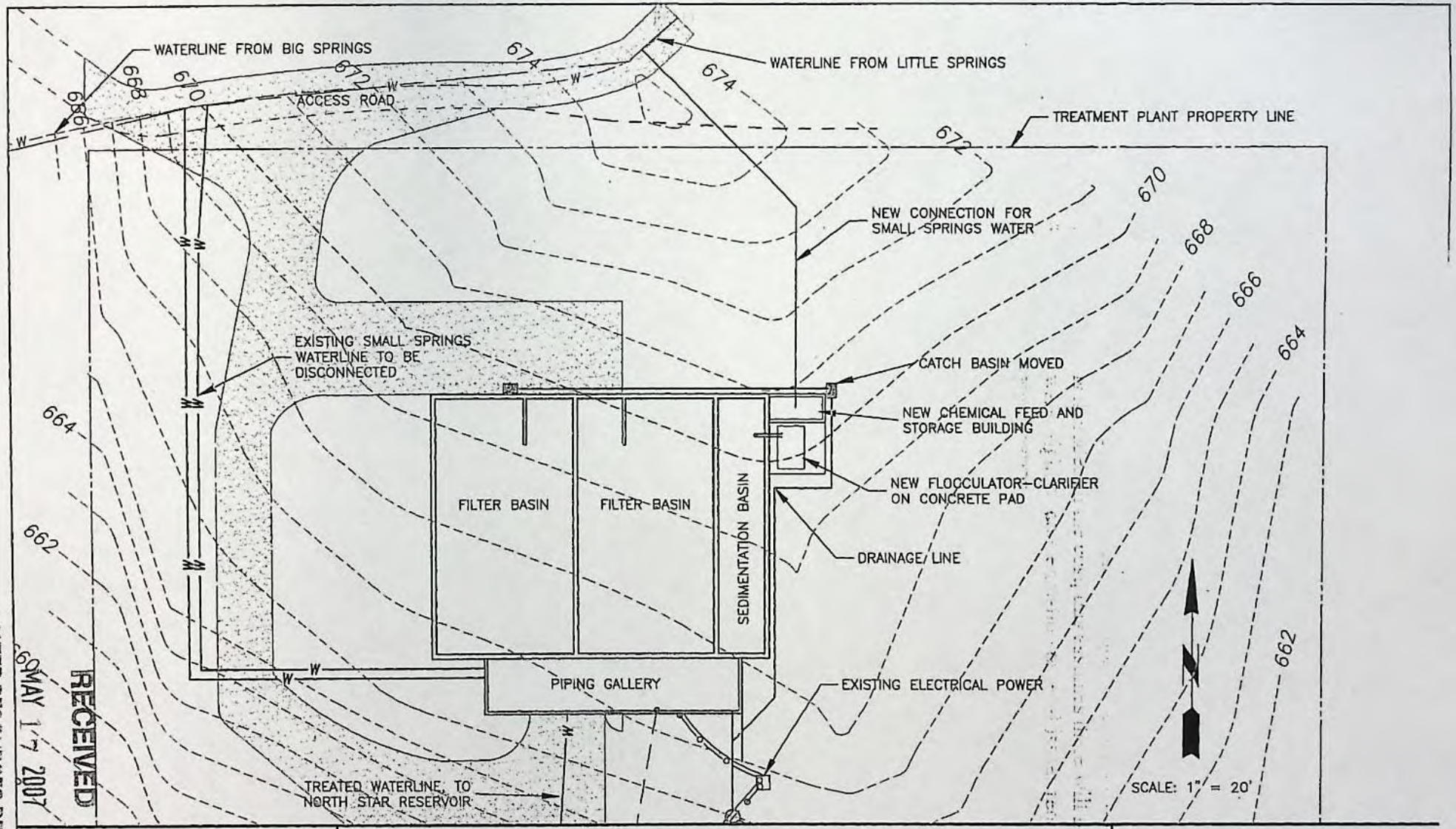
Wheeling of Water The other option for the City is the most complicated in terms of agreements and political feasibility. The general idea is to use the City of Forest Grove's water rights but instead of purchasing treated water and constructing a new pipeline, the water would be transported through the irrigation district's pipelines. The City would need to work out an arrangement to purchase or use the water rights, assuming Forest Grove would be willing to enter into an agreement. Then TVID would need to agree to transport the water, and permits would need to be worked out. This is not something TVID typically does, and the permit process is undefined. A wheeling charge, or charge to transport the water would be applied. Then when the water is delivered the water would still need to be treated, similar to the previous option. The undefined issues in the permitting process make this a low recommendation.

Recommendations

Due to many uncertainties that exist today as far as water source availability, purchase of treated water from another water purveyor isn't likely to occur in the near term. More than likely, purchase of treated water will require a commitment to a long term water resource project.

We recommend that the City actively pursue the following supply side projects:

1) Actively promote conservation.
1) Replace existing irrigation using treated water with raw water.
2) Maximize utilization of existing resource using the guidelines indicated in the study.
3) Begin the process of providing a new source on the south side of the City of Banks.

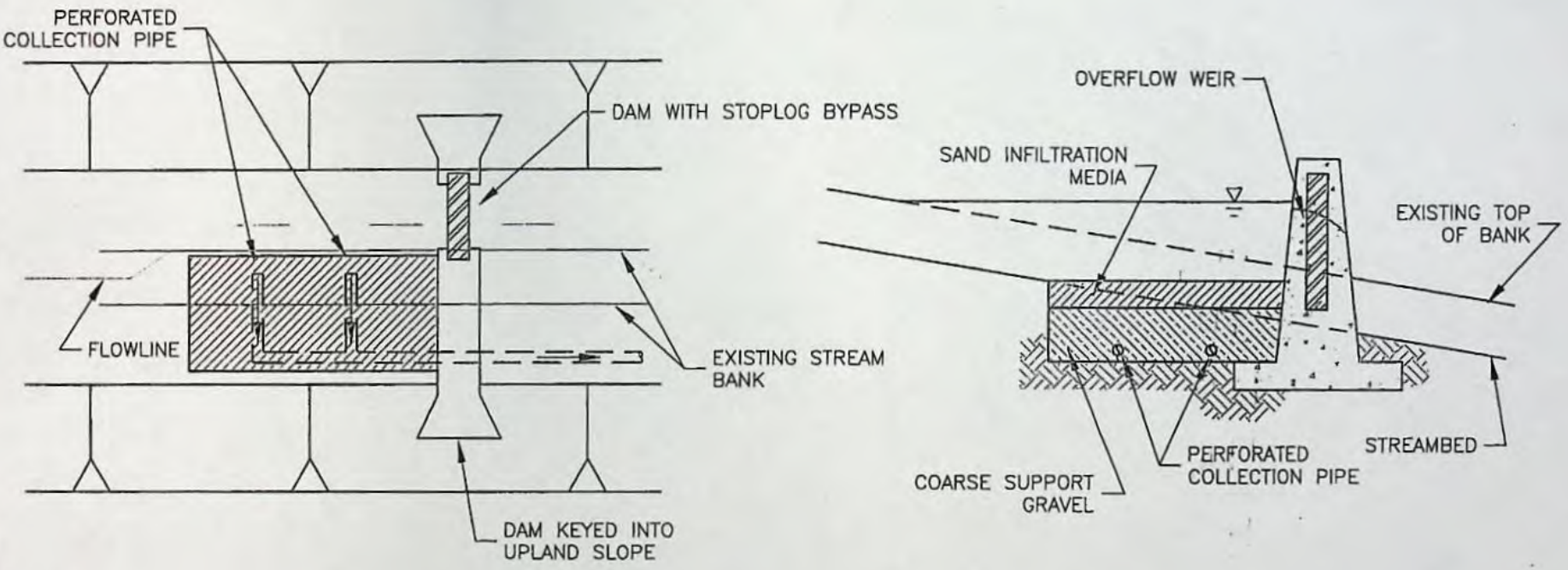


LDC Design Group Inc.

WATER MANAGEMENT AND CONSERVATION PLAN
FLOCULATION - CLARIFICATION BASIN
CITY OF BANKS, OREGON

FIGURE 6-1

2598floc-clar.dwg 1-23-01

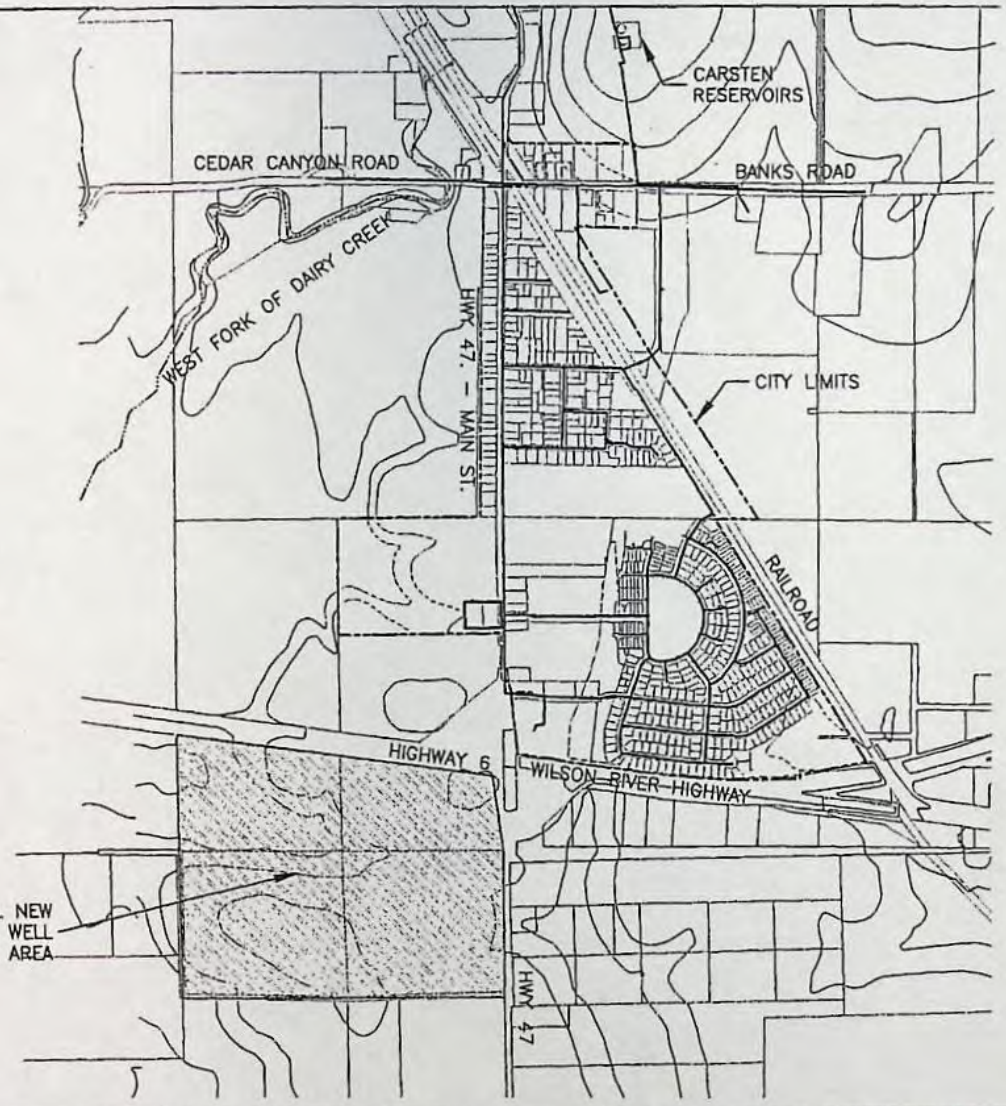


LDC Design Group Inc.

WATER MANAGEMENT AND CONSERVATION PLAN
INFILTRATION GALLERY
CITY OF BANKS, OREGON

FIGURE 6-2

2598infgtry.dwg 1-23-01



1000' 0 500' 1000'

SCALE 1" = 1000'

LEGEND

- TREATED WATER LINE
- SERVICE AREA CITY OF BANKS
- RECOMMENDED NEW WELL LOCATION
- CITY LIMITS
- CONTOUR (40')
- PROPERTY LINE
- RESERVOIR
- STREAM

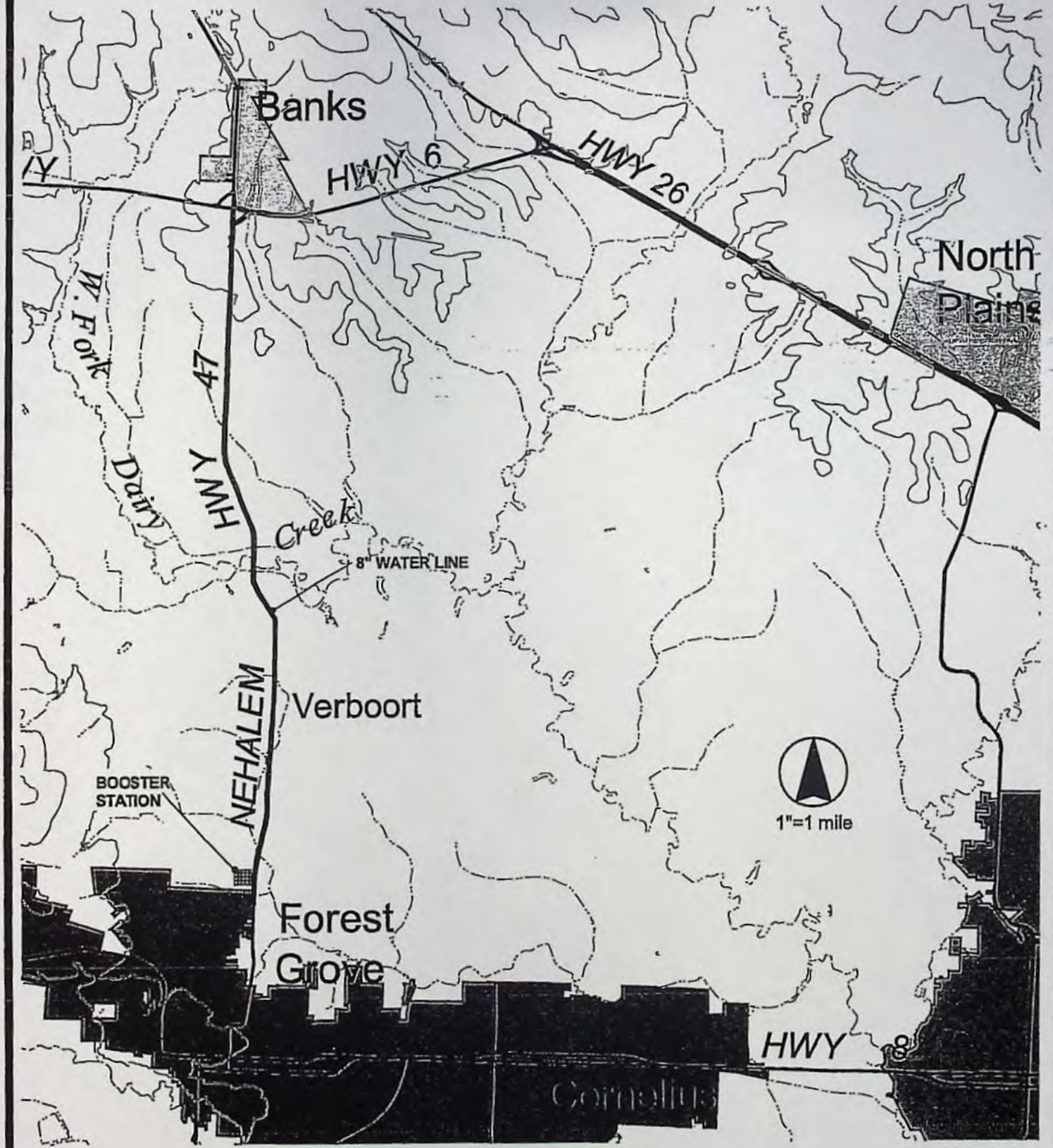
RECEIVED
MAY 17 2007
WATER RESOURCES DEPT
SALEM, OREGON

LDC Design Group Inc.

WATER MANAGEMENT AND CONSERVATION PLAN
POTENTIAL WELL LOCATION
CITY OF BANKS, OREGON

FIGURE 6-3

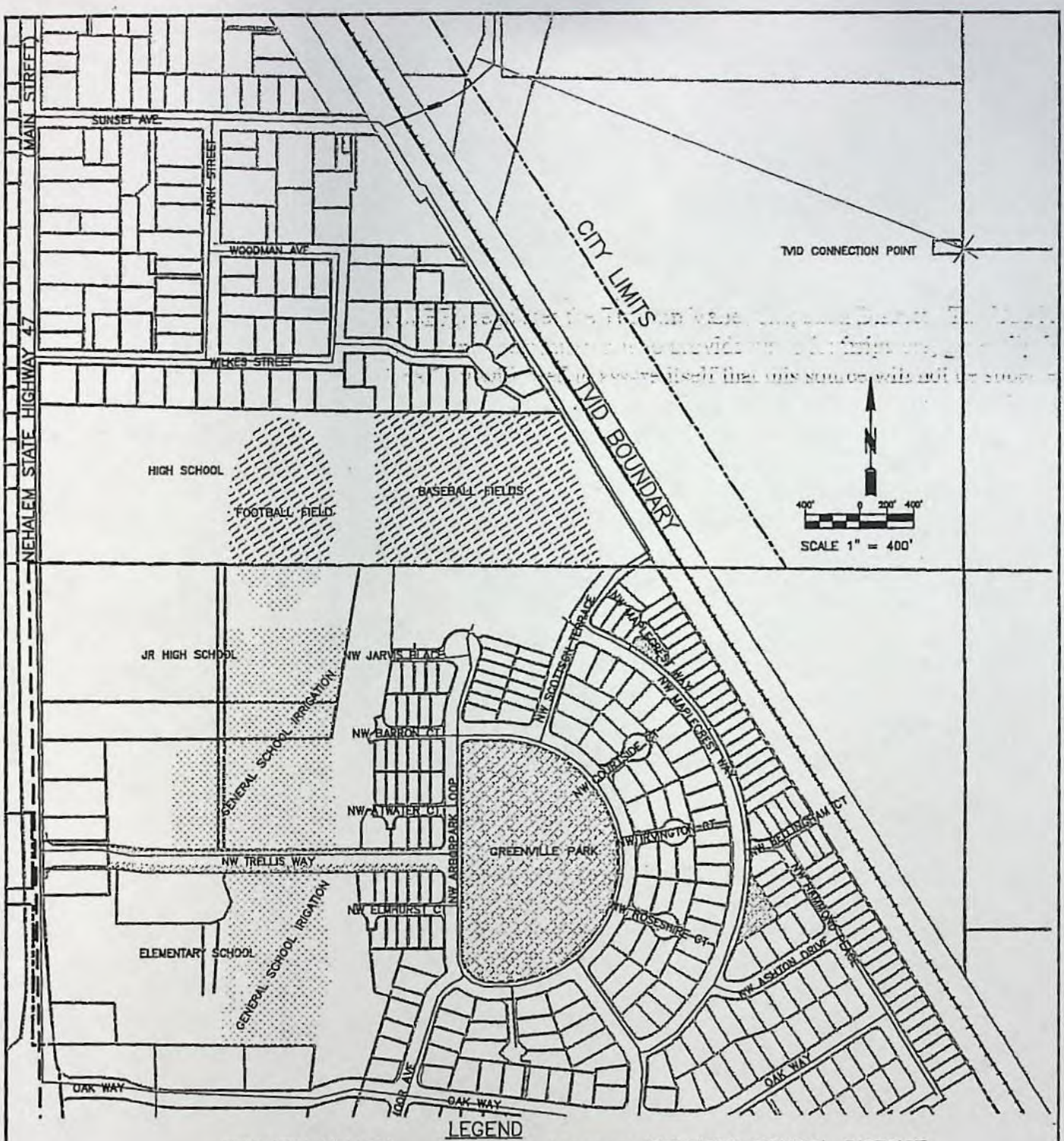
2598well.dwg 1-23-01



WATER MANAGEMENT AND CONSERVATION PLAN
FOREST GROVE CONNECTION
City of Banks

Figure 6-4

p:\projects\2598\arcview



LEGEND

- TUALATIN VALLEY IRRIGATION DISTRICT (TVID) BOUNDARY
- LOT LINES
- CITY WATER LINES
- EXISTING TVID CONNECTION
- CITY LIMITS

- IRRIGATED SCHOOL DISTRICT PROPERTY, OUTSIDE OF IRRIGATION DISTRICT
- IRRIGATED SCHOOL DISTRICT PROPERTY, INSIDE OF IRRIGATION DISTRICT
- IRRIGATED ARBOR VILLAGE GREENSPACE, INSIDE OF IRRIGATION DISTRICT

WATER MANAGEMENT AND CONSERVATION PLAN

IRRIGATION POTENTIAL
CITY OF BANKS, OREGON

FIGURE 6-5

269bir.dwg 10-10-00

CITY OF BANKS
WATER MANAGEMENT AND CONSERVATION PLAN

SECTION 7

WATER-USE CURTAILMENT PLAN

INTRODUCTION

GENERAL

The City of Banks has obtained drinking water from three springs in the hills north of the City for over 75 years. This supply was augmented by the completion of a production well adjacent to the City 20 years ago. Rapid population growth since 1996 has sharply increased the City's dependence on groundwater resources to meet peak demands. Consequently, the City has no redundancy in its water supply system during periods of high demand. Any disruption in the water supply system could lead to a water shortage.

The City has authorized the preparation of this Water-Use Curtailment Plan to aid the City through a potential water shortage. Water shortages could develop due to mechanical failure, natural disaster, prolonged drought, human error or other emergencies. The State Water Resources Department encourages the implementation of a multiple-stage water-use curtailment plan based on shortages of increasing severity. Under this approach, predetermined water shortage levels trigger stages of rationing which in turn require specific reductions in use to be sought.

PLAN OBJECTIVES

The Water-Use Curtailment Plan is an important tool to help the City deal with emergencies that could develop quickly or emergencies brought on by drought which would progressively impact water supply and demand. The Plan prioritizes use of limited water supplies to protect public safety and health during an emergency. The Plan will also provide gradually increasing levels of use curtailment, both voluntary and mandatory to deal with a shortage. Implementation of the Curtailment Plan will require a corresponding City Ordinance to be enacted.

BACKGROUND

PAST WATER SUPPLY EMERGENCIES

Large Spring. The City of Banks lost the services of the Large Spring in February and March 1996 when a mudslide washed away the old intake structure. The City relied on the Behrman Well during this period and did not suffer from severe shortages because demands were modest at that time of year. The high-zone customers that are connected to the transmission main were, however, without City water service for about two weeks. Water was provided in tank trucks by the Oregon National Guard through a Federal Emergency Management Agency program until a temporary intake was installed.

The construction of the new intake structure and water treatment plant have increased the reliability of the Large Spring as a source of supply. In general, the Green Mountain Springs have served as a stable source for about 75 years during both wet and dry periods.

Pipelines. The City of Banks has also experienced several short-term water supply emergencies over the last few years due to water line breaks. Two interruptions occurred from breaks in the treated water transmission main and one from a break in the raw water transmission main. The replacement of these pipelines as recommended in the Master Plan Update will improve the reliability of these facilities. Service was also recently affected by a break in the water main under Main Street. The failure occurred before the east-side water main loop had been constructed.

The relatively brief interruptions in service associated with these line breaks did not require the implementation of any contingency plans.

SUPPLY SYSTEM LIMITATIONS

System Redundancy. The City depends on both the Large Spring and the well to meet peak demands during the summer months. Therefore, the supply facilities do not include any redundancy in case an equipment failure or line break results in the loss of one source.

The failure of the production well during the summer months would be one possible cause of an acute water shortage. As discussed above, pipeline or intake structure failures can also interrupt service from the springs. The duration of these types of emergencies would depend on the time frame required to repair or replace the affected facilities. The development of the water-use curtailment plan provides the City with a rational procedure for dealing with water emergencies.

Effects of Long-Term Drought. The impacts that a long-term drought would have on the City's water supply are uncertain. According to rainfall data from the Oregon Climate Service, the driest period recorded at Hillsboro since 1930 was from 1985 to 1992. While Banks and the hills to the north generally receive more precipitation than Hillsboro, this period of drought would have affected the entire region. Banks did not suffer water shortages during that time span; however, demands on the system were significantly lower than they are now.

It is possible that an extended drought could cause the yield of the springs to decline or groundwater levels to drop in the well. A reduction in the pumping capacity of the well due to aquifer drawdown or a lower flow from the springs could produce shortages of longer duration. These potential circumstances increase the importance of developing both the emergency water-use curtailment plan and a conservation plan.

HEALTH AND SAFETY REQUIREMENTS OF CURTAILMENT PLAN

The water-use curtailment plan is designed to help the City allocate limited water supplies so that public health and safety can be protected during water emergencies. To support this purpose water use must be prioritized, insuring the best use of limited supplies. Water use is prioritized in the following categories, listed with the primary uses first:

1. Minimum essential indoor residential use and fire protection;
2. Minimum essential indoor uses by nonresidential customers, including schools, commercial establishments and Banks Lumber;
3. Outdoor uses and discretionary indoor uses by all customers; and
4. New customers who are not served at the time the water shortage occurs.

The amount of water required for essential indoor uses is subjective and would depend on the extent to which current water-use patterns are modified by customers. Without significant changes in behavior, average indoor residential water use in Banks is estimated to be about 75 to 80 gpcd. If the City requested that water use be curtailed due to a shortage, essential use could be expected to be about 70 gpcd. Public health could still be maintained with lower uses, but significant changes in behavior would be needed.

The amount of water required to maintain service for the second and third categories listed above would depend on the time of year that the water shortage is experienced. Essential indoor uses at the schools would be small during the summer, but significant

during the school year. Conversely, most outdoor uses are generally concentrated from mid-June to mid-September.

Banks Lumber Company currently obtains some water from a second source and may be able to further reduce its dependence on City water without curtailing operations. If that is the case, then providing water to that customer could be given a lower priority.

WATER SHORTAGE STAGES AND TRIGGERING MECHANISMS

General. The Oregon Water Resources Department encourages the implementation of a multiple-stage water-use curtailment plan based on shortages of increasing severity. Under this approach, predetermined water shortage levels trigger stages of rationing which in turn require specific reductions in use to be sought. The shortage levels used to define each stage of the plan can be based on either set deficit amounts between supply and demand or on specific system operating conditions. Since the City does not continuously measure total demand, supply deficits cannot be quantified. Therefore, operating conditions should be used to identify shortages and trigger water-use curtailment efforts.

Currently, the adequacy of the City's water supply is gauged by monitoring the operating level in the Carsten Reservoirs. If supplies do not keep pace with demand, the water levels in the tanks drop. Consequently, low reservoir level is a direct way to identify shortages that will trigger water use curtailment efforts. The lower the water level drops, the more severe the shortage and the more extensive the curtailment measures should be. Since the City plans to draw down the reservoir to meet peak daily demands, a minimum storage volume has been established as a benchmark for initiating action.

A conservative allowance for fire flow, determined from the most current ISO rating for the City, is recommended as a minimum storage volume. Using the maximum fire demand as determined using ISO documents, a minimum of about 685,000 gallons should be maintained. Prior to the construction of a new storage tank for the high zone, this volume should be available in the Carsten Reservoirs.

With both tanks in service, a water surface elevation of 400.2 feet provides a volume of 685,000 gallons. At this level the water depth is about 12 feet in Tank No. 2 and 10 feet in Tank No. 1. A water surface elevation of 403 feet should be used as a minimum benchmark to provide response time for implementing water-use curtailment measures. A water surface elevation of 403 feet corresponds to a water depth of approximately 15 feet in Tank No. 2 and 13 feet in Tanks No. 1. If the water surface reaches those levels, this would be one trigger of implementation of water-use limits.

Tracking well operating time would be a way to obtain advance notice that demand may exceed the supply rate. The well operates to keep the water surface in the tanks above a minimum level when system demands exceed the flow rate from the treatment plant. Thus, longer well running times would provide notice of a potential shortage before storage volume is reduced below a minimum level. If the well pump is running for more than 18 hours per day, or for more than 18 hours without filling the reservoirs, this would also be a trigger of implementation of water-use limits. The telemetry system will identify pump run times and reservoir levels, therefore tracking the system resources for indications of supply exceeding demand is not difficult.

The most direct triggering mechanism for water rationing would be the loss of one source of supply. Under current conditions, the loss of either the Large Spring or the Behrman Well during the summer would result in supply deficits. The deficit would be even more acute in the future since demands are projected to increase.

Water Shortage Stages and Reduction Goals. The recommended shortage stages, or levels, for a water rationing plan are presented in Table 7-1. The triggering mechanisms described above have been used to define each stage. These shortage conditions and reduction goals are based on summer operation when demands are high. Water shortages would not be likely to occur in the City during the late fall, winter and early spring. The target reductions also assume that a conservation program will be implemented that will reduce peak demands about 10 percent.

Table 7-1
Water Shortage Stages

Stage	Shortage Condition	Peak Water use Reduction Goal
1	Well running time greater than 18 hrs./day	10 percent
2	Well running time of greater than 20 hrs./day	15 percent
3	Tank water surface at elevation 403 or well running time of 22 hrs./day.	25 percent
4	Tank water surface at elevation 400 or Large Spring out of service	30 percent
5	Well out of service	60 percent

The City should reevaluate the method used to define shortage levels if an alternative water supply is developed. System redundancy would reduce the potential for shortages when flows from one source of supply are interrupted.

Curtailment Actions. Curtailment actions have been developed for each stage based on the fact that shortages are generally going to occur during peak demand periods in the summer. Therefore, the plan concentrates first on reducing outdoor water use. If equipment failures result in a supply shortage at a time when outdoor water use is relatively low, then the emphasis of the rationing methods will need to be shifted.

The curtailment actions for each shortage condition are as follows:

First Stage: Request major landscape irrigation customers to curtail all outdoor water use. Identify alternate day irrigation schedules for schools, parks and green space.

Second Stage: Mandate that major landscape irrigation customers limit outdoor water use based on an alternate day irrigation schedule. Also issue notice to public requesting all users to voluntarily conserve water.

Third Stage:	Continue mandatory restrictions of large scale irrigation users. Mandate other users limit outdoor water use per the following steps:

1. Unattended outdoor irrigation of turf and plants limited to the period between 5:00 P.M. and 9:00 A.M.
2. Limit the length of time that unattended irrigation can occur in each sprinkler zone to 20 minutes per day.
3. Limit irrigation to alternate day schedule. Even house numbers may water on even days. Odd house numbers may water on odd days.
4. Prohibit home washing of cars or hosing down of patios, walkways and other surfaces.

Fourth Stage:	Order suspension of all outdoor water use and request all customers to voluntarily curtail indoor use.
Fifth Stage:	Continue suspension of all outdoor water use and issue notice of mandatory reduction in water use for indoor purposes.

The public notification for a Second Stage condition would be aimed at outdoor uses. These uses can form a significant proportion of summer residential use and tend to be more discretionary in nature. Specific conservation measures that can be recommended would include:

- no landscape irrigation during daylight hours to reduce evaporation;
- limit length of time irrigation system is on to reduce waste from runoff and over watering;
- landscape irrigation during no more than three days per week; and
- no home washing of cars or hosing down of patios, walkways and other surfaces.

These measures could be supported by a public information program that would provide guidance on watering time required for lawns in Banks and methods for improving irrigation system efficiency.

Efforts to reduce indoor water use in response to Stage Four and Five conditions need to be flexible because these uses tend to be more resistant to change. The curtailment requests must be supported by a public information program aimed at educating people about indoor water use so that they understand how modifying their habits can affect water consumption. When issuing a notice to the public, examples of ways to conserve water should be provided.

Public notification procedures should be defined in advance. Press releases through radio, newspaper and TV should be used for Stages Two through Five. Door hangers should also be purchased so that in an emergency all customers can be notified quickly.

WATER RESTRICTION ORDINANCE

A water restriction ordinance should be approved to allow the City to implement the curtailment plan in case of a water emergency. The triggering mechanisms, stages of emergency, and curtailment actions can be incorporated into the ordinance by reference. The curtailment actions, triggering mechanisms and stages of emergency are summarized in Table 7-2 for easy reference.

Table 7-2
Water Curtailment Plan

Stage	Shortage Condition	Curtailment Method
1	Well running time greater than 18 hrs./day	Voluntary. Request major landscape irrigation customers to curtail all outdoor water use. Identify alternate day irrigation schedules for schools, parks and green space.
2	Well running time of 20 hrs./day	Voluntary & Mandatory. Mandate that major landscape irrigation customers limit outdoor water use based on irrigation schedule. Also issue notice to public requesting all users to voluntarily conserve water.
3	Tank No. 2 less than 15 feet deep or well running time of 22 hrs./day	Voluntary & Mandatory. Limit all outdoor water use to alternate day schedule during time period from 5pm to 9am, limit irrigation to 20 minutes in any one sprinkler zone, and prohibit home car washing, washing of outdoor pathways, driveways and other similar areas.
4	Tank No. 2 less than 12 feet deep or Large Spring out of service	Voluntary & Mandatory. Order suspension of all outdoor water use and request all customers to voluntarily curtail indoor use.
5	Well out of service	Mandatory. Continue suspension of all outdoor water use and issue notice of mandatory reduction in water use for indoor purposes.

CITY OF BANKS
WATER MANAGEMENT AND CONSERVATION PLAN

SECTION EIGHT

SCHEDULE FOR PLAN IMPLEMENTATION AND UPDATING

CONSERVATION PROGRAM IMPLEMENTATION SCHEDULE

It is proposed that the conservation program be developed and implemented according to the timeline presented in Table 8-1.

Table 8 - 1
Plan Implementation Schedule

Plan Element	Time Frame
General Conservation Program Planning and Development	Fall 2000 to Spring 2001
Public Information Program	Begin March 2001 and continue as a permanent plan element.
Trade Allies Landscaping Workshops	Coordinate with Columbia-Willamette Conservation Coalition.
Water Audits of Major Users	Coordinate with Columbia-Willamette Conservation Coalition.
Shift Irrigation Use to Another Source	Begin talks with irrigators Winter 2000-2001 with goal of switching prior to Summer 2001
Leak Detection and Repair	City should reevaluate water losses after Summer 2001, as monitoring data becomes available and development slows.

Program development should include joining the Columbia-Willamette Conservation Coalition and contacting nearby water providers to coordinate plans and schedules.

PLAN UPDATE SCHEDULE

This Water Management and Conservation Plan is an initial effort by the City of Banks to engage in water management practices that focus equally on demand-side and supply-side

issues. The development and implementation of a conservation program will be a new experience and an evolutionary process.

The rapid population growth and recommended use of new sources will change the City of Banks Water System. With the installation of a telemetry system and new metering in 2000, additional data will also be available regarding well use, system demands and water loss rates. Given the above circumstances, it is recommended that this plan be updated within five years.

Exhibit E: Well # 1 (Behrman), Well Log
2 pages

NOTICE TO WATER WELL CONTRACTOR
The original and first copy of this report are to be filed with the WATER RESOURCES DEPARTMENT, SALEM, OREGON 97310 within 30 days from the date of well completion.

WATER WELL REPORT
STATE OF OREGON
(Please type or print)

RECEIVED
SEP - 6 1977
(Do not write above this line)

WASH 7651

State Well No. 2N/3W-31
State Permit No.

(1) OWNER:
WATER RESOURCES DEPT. SALEM, OREGON
Name City of Banks
Address Banks, Oregon

(2) TYPE OF WORK (check):
New Well ☒ Deepening ☐ Reconditioning ☐ Abandon ☐
If abandonment, describe material and procedure in Item 12.

(3) TYPE OF WELL:
Rotary ☒ Driven ☐
Cable ☐ Jetted ☐
Dug ☐ Bored ☐

(4) PROPOSED USE (check):
Domestic ☐ Industrial ☐ Municipal ☒
Irrigation ☐ Test Well ☐ Other ☐

(5) CASING INSTALLED:
Threaded ☐ Welded ☒
8-5/8 " Diam. from plus 2 ft. to 210 ft. Gage .250
" Diam. from ft. to ft. Gage
" Diam. from ft. to ft. Gage

(6) PERFORATIONS:
Perforated? ☐ Yes ☒ No
Type of perforator used
Size of perforations in. by in.
perforations from ft. to ft.
perforations from ft. to ft.
perforations from ft. to ft.

(7) SCREENS:
Well screen installed? ☐ Yes ☒ No
Manufacturer's Name
Type Model No.
Diam. Slot size Set from ft. to ft.
Diam. Slot size Set from ft. to ft.

(8) WELL TESTS:
Drawdown is amount water level is lowered below static level
Was a pump test made? ☒ Yes ☐ No If yes, by whom? AMJannsen
Yield: 275 gal./min. with 224 ft. drawdown after 48 hrs.
150 " 146 " "
" " " "
Baller test gal./min. with ft. drawdown after hrs.
Artesian flow g.p.m.
Temperature of water 58° Depth artesian flow encountered ft.

(9) CONSTRUCTION:
Well seal—Material used Cement grout & 2% gel
Well sealed from land surface to 210 ft.
Diameter of well bore to bottom of seal 12-1/4" in.
Diameter of well bore below seal 8" in.
Number of sacks of cement used in well seal 25 sacks
How was cement grout placed? Placed on o.d. of casing & through grout pipe - 20 sacks run @ 210', 5 sacks run to top off at ground level upon completion
Was a drive shoe used? ☐ Yes ☒ No Plugs Size: location ft.
Did any strata contain unusable water? ☒ Yes ☐ No
Type of water? insufficient depth of strata 130' to 160'
Method of sealing strata off cased and cemented
Was well gravel packed? ☐ Yes ☒ No Size of gravel:
Gravel placed from ft. to ft.

(10) LOCATION OF WELL:
County Washington Driller's well number
¼ ¼ Section 31 T. 2 N R. 3 W. W.M.
Bearing and distance from section or subdivision corner

(11) WATER LEVEL: Completed well.
Depth at which water was first found 130 ft.
Static level 84 ft. below land surface. Date 8/24/77
Artesian pressure lbs. per square inch. Date

(12) WELL LOG:
Diameter of well below casing 8"
Depth drilled 450 ft. Depth of completed well 450 ft.

Formation: Describe color, texture, grain size and structure of materials; and show thickness and nature of each stratum and aquifer penetrated, with at least one entry for each change of formation. Report each change in position of Static Water Level and indicate principal water-bearing strata.

MATERIAL	From	To	SWL
Dark brown clay topsoil	0	8	
Silty brown clay	8	15	
Red-brown clay w/rotten rock fragments	15	50	
Sticky red clay-occ. rotten rock streaks	50	95	
Brown clay & rotten rock	95	110	
Dark brown & gray-brown clay --organic material	110	120	
Soft blue-gray cemented gravel	120	130	
Rotten brown basalt	130	160	20 gpm
Soft brown basalt-occ.weathered	160	195	
Black-brown basalt	195	215	
Hard gray-black basalt	215	230	
Broken brown basalt w/soapstone and lava interbeds	230	245	10 gpm
Fractured black basalt--occ. crevice	245	265	
Hard gray-black basalt, occ-			

Work started 8/16/77 19 Completed 8/24/77 19
Date well drilling machine moved off of well 8/24/77 19

Drilling Machine Operator's Certification:
This well was constructed under my direct supervision. Materials used and information reported above are true to my best knowledge and belief.
[Signed] (Drilling Machine Operator) Date 8/29/77, 19
Drilling Machine Operator's License No. 523

Water Well Contractor's Certification:
This well was drilled under my jurisdiction and this report is true to the best of my knowledge and belief.
Name A. M. Jannsen Drilling Co. (Person, firm or corporation) (Type or print)
Address 21075 SW Tualatin Valley Hwy. Aloha, Oregon
[Signed] Edward M. Jannsen (Water Well Contractor)
Contractor's License No. 79 Date 8/29/77, 19

(USE ADDITIONAL SHEETS IF NECESSARY)

SP*45656-119

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SALEM, OREGON

NOTICE TO WATER WELL CONTRACTOR
The original and first copy of this report are to be filed with the WATER RESOURCES DEPARTMENT, SALEM, OREGON 97310 within 30 days from the date of well completion.

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SALEM, OREGON

WATER WELL REPORT
STATE OF OREGON
(Please type or print)
(Do not write above this line)

State Well No. 2N/3W-31

State Permit No.

(1) OWNER:
Name City of Banks Page 2

Address

(2) TYPE OF WORK (check):
New Well ☐ Deepening ☐ Reconditioning ☐ Abandon ☐

If abandonment, describe material and procedure in Item 12.

(3) TYPE OF WELL:
Rotary ☐ Driven ☐
Cable ☐ Jetted ☐
Dug ☐ Bored ☐

(4) PROPOSED USE (check):
Domestic ☐ Industrial ☐ Municipal ☐
Irrigation ☐ Test Well ☐ Other ☐

(5) CASING INSTALLED:
Threaded ☐ Welded ☐

_____" Diam. from _____ ft. to _____ ft. Gage _____

_____" Diam. from _____ ft. to _____ ft. Gage _____

_____" Diam. from _____ ft. to _____ ft. Gage _____

(6) PERFORATIONS:
Perforated? ☐ Yes ☐ No.

Type of perforator used

Size of perforations _____ in. by _____ in.

_____ perforations from _____ ft. to _____ ft.

_____ perforations from _____ ft. to _____ ft.

_____ perforations from _____ ft. to _____ ft.

(7) SCREENS:
Well screen installed? ☐ Yes ☐ No

Manufacturer's Name

Type _____ Model No. _____

Diam. _____ Slot size _____ Set from _____ ft. to _____ ft.

Diam. _____ Slot size _____ Set from _____ ft. to _____ ft.

(8) WELL TESTS:
Drawdown is amount water level is lowered below static level

Was a pump test made? ☐ Yes ☐ No If yes, by whom?

Yield: _____ gal./min. with _____ ft. drawdown after _____ hrs.

" " " "

" " " "

Bailer test _____ gal./min. with _____ ft. drawdown after _____ hrs.

Artesian flow _____ g.p.m.

Temperature of water Depth artesian flow encountered _____ ft.

(9) CONSTRUCTION:
Well seal—Material used

Well sealed from land surface to _____ ft.

Diameter of well bore to bottom of seal _____ in.

Diameter of well bore below seal _____ in.

Number of sacks of cement used in well seal _____ sacks

How was cement grout placed?

Was a drive shoe used? ☐ Yes ☐ No Plugs _____ Size: location _____ ft.

Did any strata contain unusable water? ☐ Yes ☐ No

Type of water? _____ depth of strata _____

Method of sealing strata off

Was well gravel packed? ☐ Yes ☐ No Size of gravel: _____

Gravel placed from _____ ft. to _____ ft.

(10) LOCATION OF WELL:
County _____ Driller's well number _____

¼ ¼ Section _____ T. _____ R. _____ W.M.

Bearing and distance from section or subdivision corner

(11) WATER LEVEL: Completed well.
Depth at which water was first found _____ ft.

Static level _____ ft. below land surface. Date _____

Artesian pressure _____ lbs. per square inch. Date _____

(12) WELL LOG:
Diameter of well below casing _____

Depth drilled _____ ft. Depth of completed well _____ ft.

Formation: Describe color, texture, grain size and structure of materials; and show thickness and nature of each stratum and aquifer penetrated, with at least one entry for each change of formation. Report each change in position of Static Water Level and indicate principal water-bearing strata.

MATERIAL	From	To	SWL
fracture	265	315	5 gpm
Brown basalt-occ.broken	315	325	10 gpm
Hard black & gray-black basalt-occ. crevice	325	360	
Black basalt--occ. broken w/ green soapstone	360	380	25 gpm
Broken black & brown basalt- w/ lava & soapstone interbed	380	400	200 gpm
Broken gray-brown basalt w/ lava streaks	400	415	100gpm
Hard gray-black basalt--occ. crevice	415	450	

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SALEM, OREGON

Work started _____ 19 Completed _____ 19

Date well drilling machine moved off of well _____ 19

Drilling Machine Operator's Certification:
This well was constructed under my direct supervision. Materials used and information reported above are true to my best knowledge and belief.

[Signed] _____ Date _____, 19____
(Drilling Machine Operator)

Drilling Machine Operator's License No. _____

Water Well Contractor's Certification:
This well was drilled under my jurisdiction and this report is true to the best of my knowledge and belief.

Name _____
(Person, firm or corporation) (Type or print)

Address _____

[Signed] _____
(Water Well Contractor)

Contractor's License No. _____ Date _____, 19____

(USE ADDITIONAL SHEETS IF NECESSARY)

SP*45656-119

Exhibit F: Form C
1 page

Well

Form C (690—9-77)

IMPORTANT—This form is a notice to the Water Resources Director that permittee is ready to make **final proof** to the extent to which the water has actually been applied to the intended use under the terms of the permit. Permittee is cautioned that Certificate of Water Right will be issued based on the extent of the quantity and use as determined by the **final proof** inspection and survey which will be made in response to the filing of this Form C.

NOTE: In the case of an irrigation permit, this Form C should not be mailed to the Water Resources Department until all of the land described in the permit, which it is intended to irrigate under this permit at any time, has actually been irrigated.

Fill out, detach and mail to the Water Resources Department, Salem, OR 97310, when all of the water has been applied.

Application No. G8476

NOTICE OF COMPLETE APPLICATION OF WATER TO A BENEFICIAL USE

I, CITY OF BANKS, OREGON, the holder of Permit No. G7593

to appropriate the public waters of the state of Oregon, completely applied the waters to a beneficial use in accordance with the terms of said permit, on the 1st day of OCTOBER, 1980

Remarks: Water was used beginning June 13th, 1980 to funish water for the State of Oregon for ash removal - On line and operating fully October 1st., 1980

IN WITNESS WHEREOF, I have hereunto set my hand this 1st day of December, 1980

Lowell D. Steinbach, Mayor (Signature of Applicant) City of Banks, Banks, Or 97106 (Address)

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WATER RESOURCES DEPT
SALEM, OREGON

Application No. G8476

Form B (690—9-77)

NOTICE OF COMPLETION OF CONSTRUCTION

I, CITY OF BANKS, OREGON, the holder of Permit No. G7593

to appropriate the public waters of the state of Oregon, completed the construction of the works described therein on the 30th day of OCTOBER, 19 79

Remarks: If the works have less capacity than described in the permit, or you have definitely abandoned part of the proposed development, you should so state in order that our records may not be unnecessarily encumbered.

IN WITNESS WHEREOF, I have hereunto set my hand this 2 day of December, 1980

Lowell D. Steinbach Mayor (Signature of Applicant) City of Banks, Banks, Or. 97106 (Address)

Fill out, detach and mail to the Water Resources Department, Salem, OR 97310, when construction work is completed.

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WATER RESOURCES DEPT

WRD0027

Exhibit G: Well #2, Well Log
2 pages

RECEIVED WASH 62373

JUN 02 2005

WATER RESOURCES DEPT
SALEM, OREGON

STATE OF OREGON
WATER SUPPLY WELL REPORT
(as required by ORS 537.765)

WELL I.D. # L 75346

START CARD # 173577

Instructions for completing this report are on the last page of this form

(1) LAND OWNER Well Number
Name City of Banks
Address 100 South Main Street
City Banks State Or Zip 97106

(2) TYPE OF WORK ☒ New Well
☐ Deepening ☐ Alteration (repair/recondition) ☐ Abandonment ☐ Conversion

(3) DRILL METHOD
☒ Rotary Air ☒ Rotary Mud ☐ Cable ☐ Auger ☐ Cable Mud
☐ Other

(4) PROPOSED USE
☐ Domestic ☒ Community ☐ Industrial ☐ Irrigation
☐ Thermal ☐ Injection ☐ Livestock ☐ Other

(5) BORE HOLE CONSTRUCTION Special Construction: ☐ Yes ☒ No
Depth of Completed Well 665 ft.
Explosives used: ☐ Yes ☒ No Type Amount

BORE HOLE Diameter	From	To	SEAL Material	From	To	Sacks or Pounds
16	0	300	Cem/Bent	0	300	115 sks
12	300	665				

How was seal placed: Method ☐ A ☒ B ☒ C ☐ D ☐ E
☐ Other
Backfill placed from ft. to ft. Material
Gravel placed from ft. to ft. Size of gravel

(6) CASING/LINER

	Diameter	From	To	Gauge	Steel	Plastic	Welded	Threaded
Casing:	12	+2	300	.250	☒	☐	☒	☐
					☐	☐	☐	☐
					☐	☐	☐	☐
Liner:					☐	☐	☐	☐
					☐	☐	☐	☐

Drive Shoe used ☐ Inside ☐ Outside ☒ None
Final location of shoe(s)

(7) PERFORATIONS/SCREENS
☐ Perforations Method
☐ Screens Type Material

From	To	Slot Size	Number	Diameter	Tele/pipe size	Casing	Liner
						☐	☐
						☐	☐
						☐	☐
						☐	☐
						☐	☐

(8) WELL TESTS: Minimum testing time is 1 hour
☐ Pump ☐ Bailer ☒ Air ☐ Flowing Artesian

Yield gal/min	Drawdown	Drill stem at	Time
650+		660	1hr.
275-280		200	1hr.

Temperature of water 57°F Depth Artesian Flow Found
Was a water analysis done? ☒ Yes By whom A.M.J.
Did any strata contain water not suitable for intended use? ☐ Too little
☐ Salty ☐ Muddy ☐ Odor ☐ Colored ☐ Other
Depth of strata:

(9) LOCATION OF WELL (legal description)
County Washington
Tax Lot 402 Lot
Township 2N N or S Range 3W E or W WM
Section 31 NE 1/4 NW 1/4
Lat ___ ° ___ ' ___ " or _____ (degrees or decimal)
Long ___ ° ___ ' ___ " or _____ (degrees or decimal)
Street Address of Well (or nearest address)
42000 NW Banks Rd. Banks, Or

(10) STATIC WATER LEVEL
48 ft. below land surface. Date 5-25-05
ft. below land surface. Date
Artesian pressure lb. per square inch Date

(11) WATER BEARING ZONES
Depth at which water was first found 378

From	To	Estimated Flow Rate	SWL
378	468	350 gpm	48
615	660	300 gpm	48

(12) WELL LOG Ground Elevation

Material	From	To	SWL
Brn & red-brn cly sticky, firm.	0	69	
Red-brn basalt, very weathered.	69	102	
Green clay soft	102	121	
Gry-brn clay firm	121	155	
Red-brn basalt very weathered.	155	179	
Brn basalt, weathered	179	201	
Gry-brn basalt	201	206	
Gry/gry-blk basalthrd	206	231	
Gry-brn basalt w/ interbeds.	231	251	
Gry-gry blk basalt hrd	251	313	
Brn basalt interbed	313	325	

Date Started 3-22-05 Completed 5-25-05

(unbonded) Water Well Constructor Certification
I certify that the work I performed on the construction, deepening, alteration, or abandonment of this well is in compliance with Oregon water supply well construction standards. Materials used and information reported above are true to the best of my knowledge and belief.

WWC Number 573 Date 5-31-2005
Signed

(bonded) Water Well Constructor Certification
I accept responsibility for the construction, deepening, alteration, or abandonment work performed on this well during the construction dates reported above. All work performed during this time is in compliance with Oregon water supply well construction standards. This report is true to the best of my knowledge and belief.

WWC Number 1266 Date May 31, 2005
Signed

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SALEM, OREGON

Conti. Page 2

RECLWASH 62373

JUN 02 2005

WATER RESOURCES DEPT
SALEM, OREGON

STATE OF OREGON
WATER SUPPLY WELL REPORT
(as required by ORS 537.765)

WELL I.D. # L 75346

START CARD # 173577

Instructions for completing this report are on the last page of this form

(1) LAND OWNER Well Number
Name City of Banks Conti. Page 2
Address 100 South Main Street
City Banks State OR Zip 97106

(2) TYPE OF WORK ☒ New Well
☐ Deepening ☐ Alteration (repair/recondition) ☐ Abandonment ☐ Conversion

(3) DRILL METHOD
☒ Rotary Air ☒ Rotary Mud ☐ Cable ☐ Auger ☐ Cable Mud
☐ Other

(4) PROPOSED USE
☐ Domestic ☒ Community ☐ Industrial ☐ Irrigation
☐ Thermal ☐ Injection ☐ Livestock ☐ Other

(5) BORE HOLE CONSTRUCTION Special Construction: ☐ Yes ☒ No
Depth of Completed Well 665 ft.
Explosives used: ☐ Yes ☒ No Type Amount

BORE HOLE Diameter	From	To	SEAL Material	From	To	Sacks or Pounds

How was seal placed: Method ☐ A ☐ B ☐ C ☐ D ☐ E
☐ Other
Backfill placed from ft. to ft. Material
Gravel placed from ft. to ft. Size of gravel

(6) CASING/LINER

	Diameter	From	To	Gauge	Steel	Plastic	Welded	Threaded
Casing:					☐	☐	☐	☐
					☐	☐	☐	☐
					☐	☐	☐	☐
Liner:					☐	☐	☐	☐
					☐	☐	☐	☐

Drive Shoe used ☐ Inside ☐ Outside ☐ None
Final location of shoe(s)

(7) PERFORATIONS/SCREENS
☐ Perforations Method
☐ Screens Type Material

From	To	Slot Size	Number	Diameter	Tele/pipe size	Casing	Liner
						☐	☐
						☐	☐
						☐	☐
						☐	☐
						☐	☐

(8) WELL TESTS: Minimum testing time is 1 hour
☐ Pump ☐ Bailer ☐ Air ☐ Flowing Artesian

Yield gal/min	Drawdown	Drill stem at	Time

Temperature of water Depth Artesian Flow Found
Was a water analysis done? ☐ Yes By whom
Did any strata contain water not suitable for intended use? ☐ Too little
☐ Salty ☐ Muddy ☐ Odor ☐ Colored ☐ Other
Depth of strata:

(9) LOCATION OF WELL (legal description)
County Washington
Tax Lot 402 Lot
Township 2N N or S Range 3W E or W WM
Section 31 NE 1/4 NW 1/4
Lat ° ' " or (degrees or decimal)
Long ° ' " or (degrees or decimal)
Street Address of Well (or nearest address)
42000 NW Banks Rd., Banks, OR

(10) STATIC WATER LEVEL
48 ft. below land surface. Date 05/25/2005
ft. below land surface. Date
Artesian pressure lb. per square inch Date

(11) WATER BEARING ZONES
Depth at which water was first found

From	To	Estimated Flow Rate	SWL

(12) WELL LOG Ground Elevation

Material	From	To	SWL
Blk basalt, fracs, occ soapstone.	325	378	
Brn/gry-brn basalt frac broken occ red-brn basalt/lava streaks	378	420	48
Blk/gry blk basalt/lava	420	468	
Blk/gry blk basalt, hard occ fracs.	468	615	
Blk basalt interbed, occ claystone occ lava streaks.	615	660	48
Blk/gry-blk basalt, fracs.	660	665	

Date Started 3-22-2005 Completed 5-25-2005

(unbonded) Water Well Constructor Certification
I certify that the work I performed on the construction, deepening, alteration, or abandonment of this well is in compliance with Oregon water supply well construction standards. Materials used and information reported above are true to the best of my knowledge and belief.

WWC Number 573 Date 5-31-2005
Signed

(bonded) Water Well Constructor Certification
I accept responsibility for the construction, deepening, alteration, or abandonment work performed on this well during the construction dates reported above. All work performed during this time is in compliance with Oregon water supply well construction standards. This report is true to the best of my knowledge and belief.

WWC Number 1266 Date May 31, 2005
Signed

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Exhibit H: T 10055
8 pages

Oregon Water Resources Department
725 Summer Street NE, Suite A
Salem, Oregon 97301-1271
(503) 986-0900
www.wrd.state.or.us

Application for Water Right
Transfer

Please type or print legibly in dark ink. If your application is incomplete or inaccurate, we will return it to you. If any requested information does not apply to your application, insert "n/a". Please read and refer to the instructions when completing your application. A summary of review criteria and procedures that are generally applicable to these applications is available at www.wrd.state.or.us/publication/reports/index.shtml.

APPLICATION FOR:

Please check one

☐ Water Right Transfer	☐ Temporary Transfer	☐ Drought Transfer
☐ Historic Change in POD	(number of years ____)	☐ Point of Diversion Change
☐ To Instream Use	☑ Permit Amendment	Due to Government Action
☐ Other Transfer		

1. APPLICANT INFORMATION

Name: City of Banks
First Last

Address: _____

Banks OR 97106
City State Zip

Phone: 503-324-5112
Home Work Other

*Fax: 503-324-6674 *E-Mail address: _____

Optional information

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2. AGENT INFORMATION

(The agent listed is authorized to represent the applicant in all matters relating to this transfer application)

Name: Tom Michalek
First Last

Address: LDC Design Group, 20085 NW Tanasbourne Drive

Hillsboro OR 97124
City State Zip

Phone: 503-858-4242
Home Work Other

*Fax: 503-645-5500 *E-Mail address: michalekt@ldcdesign.com

Optional information

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FSD

T 10055

OWRD0019

3. TYPE OF CHANGE PROPOSED

Please check all that apply

Point of Diversion or Appropriation	Place of Use	Character of Use (n/a for Permit Amendments)
☐ Change (The old point of diversion or appropriation will **not** be used for the portion of the water right affected by the transfer.) ☑ Additional (Both the old and new points of diversion or appropriation will be used for the portion of the water right affected by the transfer.) ☐ Historic Point of Diversion (Unauthorized point of diversion used for more than 10 years.) ☐ Surface Water to Ground Water (A new point of appropriation will be used **instead of** the old point of diversion and not as an additional point of appropriation.)	☐ All, or a portion, of the right will be exercised at a different location than currently authorized. (Use of water at the current location will be discontinued.) ☐ Exchange (Water from another source will be used in exchange for supplying an equal amount of replacement water to that source.)	Proposed new use: ☐ Irrigation ☐ Municipal ☐ Quasi-municipal ☐ Commercial ☐ Industrial ☐ Instream (complete **Supplemental Form B**) ☐ Domestic (indicate number of households) _____ ☐ Other _____ ☐ Substitution (A supplemental ground water right will be substituted for a primary surface water right.)

Reason for changes: Add an additional well to the existing system to increase groundwater pumping capacity to meet the allowable permit maximum.

Describe the ***current*** water delivery system. Include information on the pumps, canals, pipelines and sprinklers used to divert, convey and apply the water at the authorized place of use.

The description must be sufficient to demonstrate that the full quantity of water to be transferred can be conveyed from the authorized source and applied at the authorized location and that the applicant is ready, willing, and able to exercise the right. (Not applicable to applications for Permit Amendments.)

n/a

System capacity: _____ cubic feet per second (cfs)

*Attach one or more **Evidence of Use Affidavits** (Supplemental Form A) demonstrating that each of the right(s) involved in the transfer have been exercised in the last five years or that a presumption of forfeiture for non-use could be rebutted. (Not applicable to applications for Permit Amendments.)*

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4. CURRENT WATER RIGHT INFORMATION

A separate page providing the information in this section must be completed for each certificate, permit, decree, or other right involved in the proposed transfer.

Water Right Subject to Transfer (check and complete **one** of the following):

☐	Certificated Right	Certificate Number	Permit Number or Decree Name
☐	Adjudicated, Un-certificated Right	Name of Decree	Page Number
☐	Permit for which Proof has been Approved	Permit Number	Date Claim of Beneficial Use Submitted
☐	Transferred Right for which Proof has been Filed	Previous Transfer Number	Date Claim of Beneficial Use Submitted
☑	Permit for which an Amendment is Requested	G-7593 Permit Number	Completion Date of Permit

Name on Permit, Certificate, or Decree: City of Banks

County: Washington Authorized Use(s): Municipal

Are there multiple **Priority Dates** identified on the water right? ☐ Yes ☑ No

*If "Yes", any information provided on **Page 4 must** identify which priority date is associated with each of the proposed points of diversion/appropriation and places of use. In addition, list those priority dates:* September 29, 1977

Source(s) of Water Listed on Right: A Well

Tributary to: E. Fork Diary Creek basin

Are there other **Sources** listed on the water right? ☐ Yes ☑ No

*If "Yes", any information provided on **Page 4 must** identify which source is associated with each of the proposed points of diversion/appropriation and proposed places of use. In addition, list those other sources:*

Are there **Other Water Rights** or permits associated with this land? ☑ Yes ☐ No

If "Yes", what are the Permit or Certificate Numbers? Cert. 5353, S-48173

Pursuant to ORS 540.510, any right that is supplemental to a primary right proposed for transfer must be included in the transfer or be cancelled.

Remarks: The permits and certificate held by the City of Banks are for municipal use within the City's service area.

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Certificate Number or other identifying number from ***Page 3***: Permit G-7593

*A separate page providing the following information must be completed for **each** certificate, permit, decree, or other right involved in the proposed transfer.*

Is the entire water right identified on ***Page 3*** affected by this transfer? ☑ Yes ☐ No

*If "**Yes**", the remainder of **this page need not** be completed.*
*If "**No**", the following information **must be provided** only for those points of diversion/appropriation and places of use that are **involved in the transfer**.*

Government lot and donation land claim numbers must be included in the tables below only if the information is reflected on the existing water right.

Location of Existing Authorized Point(s) of Diversion or Appropriation to be Changed:

Township		Range		Mer	Sec	¼ ¼ Section	Gov't Lot or DLC	Survey Coordinates (coordinates from a recognized survey corner)
2	N	3	W		31	NE, NW		150 feet south and 1,990 feet east of northwest corner of section 31.

Location of Existing Authorized Place of Use to be Changed:

Township		Range		Mer	Sec	¼ ¼ Section	Gov't Lot or DLC	Acres (if applicable)

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SALEM, OREGON

T 10055

OWRD0022

Received October 20, 2006

5. PROPOSED CHANGES TO THE WATER RIGHT

A separate page providing the information in this section must be completed for each certificate, permit, decree, or other right involved in the proposed transfer.

Certificate Number or other identifying number from ***Section 4***: Permit G-7593

Location of Proposed Point(s) of Diversion or Point(s) of Appropriation:

Township		Range		Mer	Sec	¼ ¼ Section	Gov't Lot or DLC	Survey Coordinates (coordinates from a recognized survey corner)
2	N	3	W		31	NE,NW		100 feet south and 2,015 feet east of northwest corner of section 31

Attach additional copies as necessary to describe locations of other proposed points of diversion or appropriation. Clearly mark each of the additional copies with the appropriate Certificate Number or other identifying number. Not applicable to applications for transfers to instream water rights.

Location of Proposed Place of Use:

Township		Range		Mer	Sec	¼ ¼ Section	Gov't Lot or DLC	Acres (if applicable)

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SALEM, OREGON

Attach additional copies as necessary to describe locations of other proposed places of use. Clearly mark each of the additional copies with the appropriate Certificate Number or other identifying number. Not applicable to applications for transfers to instream water rights.

Remarks: Place of use will not change and will remain within the City of Banks service area.

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OWRD0023

6. AFFECTED DISTRICTS AND LOCAL GOVERNMENTS

Are any of the water rights proposed for transfer located within or served by an irrigation or other water district? ☑ Yes ☐ No

Will any of the water rights be located within or served by an irrigation or other water district after the proposed transfer? ☑ Yes ☐ No

Is water for any of the rights supplied under a water service agreement or other contract for stored water with a Federal agency? ☐ Yes ☑ No

If "Yes", for any of the above, list the name and mailing address of the district and/or agency:

City of Banks, 100 S. Main St., Banks, OR 97124

List the name and mailing address of all affected local governments (e.g., county, city, municipal corporation, and tribal governments within whose jurisdiction the rights are located).

City of Banks, 100 S. Main St., Banks, OR 97124

7. LAND OWNERSHIP

Does the applicant own the lands **FROM** which the right is being transferred? ☐ Yes ☐ No

If "No", provide the following information. For Temporary Transfers, also include a notarized statement granting consent to the transfer from each of the landowners:

Names of Current Landowner(s): N/A
First Last

Address:

City State Zip

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MAY 17 2007
WATER RESOURCES DEPT
SALEM, OREGON

Does the applicant own the lands **TO** which the right is being transferred? ☐ Yes ☐ No

If "No", provide the following information:

Names of Receiving Landowner(s): N/A
First Last

Address:

City State Zip

Check one of the following:

☐ The receiving landowner will be responsible for completion of the proposed changes after the final order is issued. All notices and correspondence should be sent to this landowner.

☐ The applicant will remain responsible for completion of changes. Notices and correspondence should continue to be sent to the applicant and applicant's agent.

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DEC 28 2005
WATER RESOURCES DEPT
SALEM, OREGON

8. ATTACHMENTS

Check each of the following attachments included with this application. The application will be returned if all required attachments are not included.

Form A – Evidence of Use Affidavits

☑ At least one Evidence of Use Affidavit documenting that the right has been used during the last five years or that the right is not subject to forfeiture under ORS 540.610 is attached. The affidavit provided must be the original, not a copy.

Form B – Instream Water Right Transfer

☐ Required for instream transfers only.

Map

☐ Permanent Water Right Transfer
The map must be prepared by a Certified Water Right Examiner and meet the requirements of OAR 690-380-3100 unless a waiver has been granted. The map provided must be the original, not a copy.

☑ Permit Amendment, Temporary Transfer, or Other Application
A map meeting the requirements of OAR 690-380-3100 must be included but need not be prepared by a Certified Water Right Examiner.

Evidence of Lien Holder Notification

☐ Copies of the written notification of the proposed transfer provided by the applicant to each lien holder, unless the water right has been quit claimed.

Recorded Deed

☐ Required for temporary transfers only.

Land Use Information Form:

☑ Enclosed

☐ Not Required if all of the following are met:
1. In EFU zone or irrigation district,
2. Change in place of use only,
3. No structural changes needed, including diversion works, delivery facilities, other structures, and
4. Irrigation only.

Water Well Reports/Well Logs:

☑ The application is for a change in point of appropriation or change from surface water to ground water and copies of all water well reports are attached.

☐ Water well reports are not available and a description of construction details including well depth, static water level, and information necessary to establish the ground water body developed or proposed to be developed is attached.

☐ The application is for a surface water transfer and water well reports are not required.

Fees:

☑ Amount enclosed: $ 350.00
See the Department's Fee Schedule at www.wrd.state.or.us or call (503) 986-0900.

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SALEM, OREGON

9. SIGNATURES

I (we) understand that prior to approval of a permanent transfer and after issuance of a draft preliminary determination by the Department, I (we) must submit:

(1) A report on ownership and lien information prepared by a title company within the last three months if required under OAR 690-380-3000(18), and

(2) If I (we) are not the landowners, proof that the landowner or entity to which the water right has been quitclaimed consents to the transfer or that ownership information is not required.

I (we) affirm that the information contained in this application is true and accurate.

applicant signature	name (print)	date
Michael Lyda	Michael Lyda	12/20/05

Before submitting your application, be sure you have:

- Answered each question completely.
- Included the required attachments.
- Provided original signatures for all named deed holders or other parties with an interest in the right.
- Included a check payable to the Oregon Water Resources Department for the appropriate amount.

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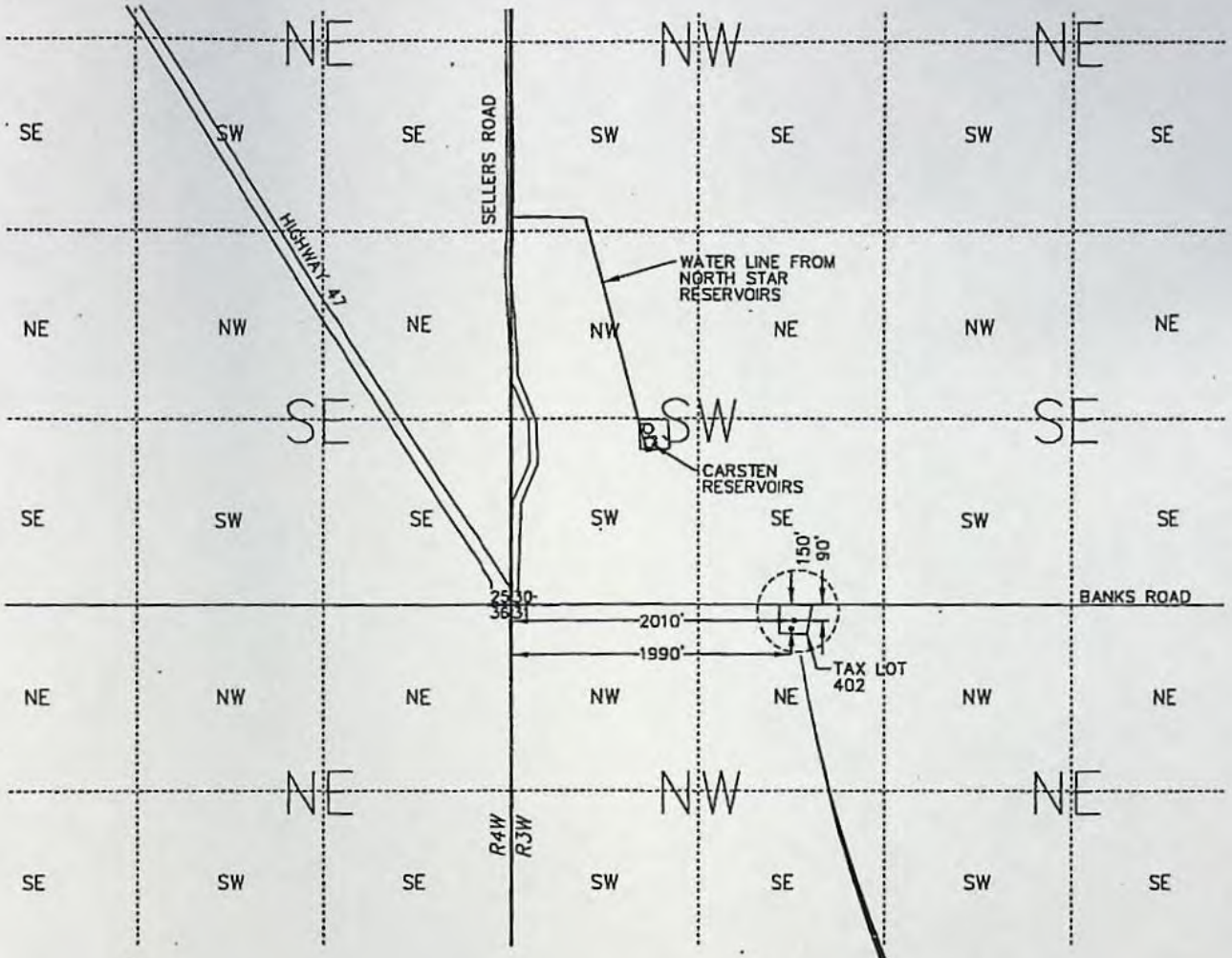
T 10055

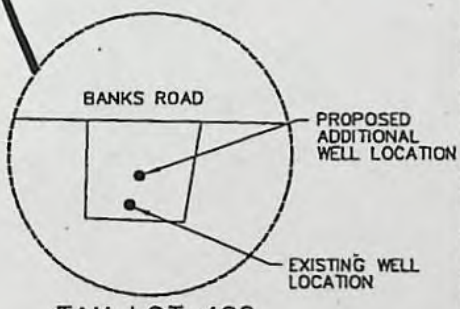
SECTION 31 T2N R3W W.M.



NORTH

0 1320

1 inch = 1320 ft.



TAX LOT 402
1" = 400'

EXISTING POINT OF APPROPRIATION: A WELL, LOCATED 150' SOUTH AND 1990' EAST OF THE NORTHWEST CORNER OF SECTION 31.

PROPOSED POINT OF APPROPRIATION: 90' SOUTH AND 2010' EAST OF THE NORTHWEST CORNER OF SECTION 31.

PLACE OF USE: WITHIN THE SERVICE BOUNDARIES OF THE CITY OF BANKS.

THE PREPARATION OF THIS MAP WAS FOR THE PURPOSE OF IDENTIFYING THE LOCATION OF THE WATER RIGHTS AND HAS NO INTENT TO PROVIDE DIMENSIONS OR LOCATIONS OF PROPERTY OWNERSHIP LINES.

PREPARED FOR:
CITY OF BANKS
100 SOUTH MAIN STREET
BANKS, OREGON 97106
503-324-5112
T 10055

LDC Planners Engineers Surveyors
DESIGN GROUP
20085 N.W. TANASBOURNE DR.
HILLSBORO, OREGON 97124
PHONE:(503) 858-4242
FAX:(503) 645-5500
www.ldcdesign.com

DRAWING TITLE:
PERMIT AMENDMENT MAP
APPL. G-8476
PERMIT G-7593
CITY OF BANKS

KWH

JOB NO.: 0036

DRAWING NO.: 1 OF 1

HanK, Plotted: Sep 19, 2005 - 9:50am, P:\0_Archive\p\dwg\Water Rights\3061PAM.dwg

OWRD0026

Exhibit I: Table 4 of 2006 Oregon Population Report; by Portland State University Population Research Center
1 page

Table 4. Population Estimates for Oregon and Its Counties and Incorporated Cities: April 1, 1990 to July 1, 2006

County and Cities	July 1 Population Estimates							Census Population	
	2006	2005	2004	2003	2002	2001	2000	4/1/2000	4/1/1990
WALLOWA	7,140	7,130	7,150	7,150	7,150	7,100	7,250	7,226	6,911
Enterprise	1,945	1,945	1,940	1,920	1,920	1,890	1,895	1,895	1,905
Joseph	1,095	1,090	1,080	1,080	1,070	1,060	1,055	1,054	1,073
Lostine	250	250	250	250	250	260	265	263	231
Wallowa	870	870	870	870	870	870	870	869	748
Unincorporated	2,980	2,975	3,010	3,030	3,040	3,020	3,165	3,145	2,954
WASCO	24,070	23,935	23,900	23,550	23,750	24,150	23,850	23,791	21,683
Antelope	60	60	60	60	60	60	60	59	34
Dufur	630	610	610	600	590	590	590	588	527
Maupin	470	450	450	450	450	420	410	411	456
Mosier	460	420	420	430	430	410	415	410	244
Shaniko	20	20	20	30	30	30	25	26	26
The Dalles*	12,625	12,505	12,410	12,350	12,250	12,230	12,185	12,156	11,021
Unincorporated	9,805	9,870	9,930	9,630	9,940	10,410	10,165	10,141	9,375
WASHINGTON	500,585	489,785	480,200	472,600	463,050	455,800	449,250	445,342	311,554
Banks	1,435	1,430	1,430	1,430	1,420	1,400	1,310	1,286	563
Beaverton	84,270	83,095	79,350	79,010	77,990	77,170	77,050	76,129	53,307
Cornelius	10,785	10,585	10,150	10,150	9,930	9,710	9,760	9,652	6,148
Durham	1,400	1,390	1,400	1,400	1,390	1,390	1,400	1,382	748
Forest Grove	20,380	19,565	19,200	19,130	18,750	18,380	17,830	17,708	13,559
Gaston	630	630	620	620	610	640	600	600	563
Hillsboro	84,445	82,025	79,940	79,340	74,840	73,200	71,455	70,186	37,598
King City	2,350	2,130	2,100	2,100	2,110	2,060	1,945	1,949	2,060
Lake Oswego (part)**	20	20	20	20	17	15	15	15	6
North Plains	1,755	1,700	1,650	1,640	1,660	1,660	1,625	1,605	972
Portland (part)**	1,500	1,455	1,440	1,430	1,411	1,405	1,395	1,388	1,197
Rivergrove (part)**	35	35	30	30	30	30	35	37	27
Sherwood	16,115	14,940	14,190	14,050	13,680	12,840	12,230	11,791	3,093
Tigard	46,300	45,500	44,650	45,130	44,070	43,040	42,260	41,223	29,435
Tualatin (part)**	22,585	22,400	22,045	21,970	21,360	20,545	20,370	20,127	13,258
Wilsonville (part)**	1,655	1,655	1,655	1,655	5	5	5	4	10
Unincorporated	204,925	201,230	200,330	193,495	193,778	192,310	189,965	190,260	149,010
WHEELER	1,565	1,550	1,550	1,550	1,550	1,550	1,550	1,547	1,396
Fossil	460	460	460	460	470	470	470	469	399
Mitchell	170	170	170	170	170	170	170	170	163
Spray	160	140	140	140	140	140	140	140	149
Unincorporated	775	780	780	780	770	770	770	768	685

Exhibit J: Methodology used in Oregon Population Report; by Portland State University Population Research Center
2 pages

Population Estimates for Oregon, July 1, 2006

This report contains the annual population estimates for Oregon, and its counties, incorporated cities, and unincorporated areas for July 1, 2006. Included are estimates that are summarized by unincorporated and incorporated areas at the State level, as well as metropolitan areas and non-metropolitan areas. There are ten tables that show the current population estimates. Some tables include historical estimates and Census populations. Other tables display the components (natural increase and net migration) of population change, and some show population estimates for age groups and gender by county. The population estimates for cities are presented in three tables; one is alphabetized, another shows population in rank order, and the other holds city estimates grouped by the county in which the city is located. For cities that are located in more than one county, population estimates for city parts are shown in a separate table. Also, populations added to cities due to annexations from April 1, 2000 to July 1, 2006 are included in a table.

At the end of this report there are 6 maps depicting county-level population estimates for 2006 and/or population change from 2000 to 2006. There also is a county reference map that shows locations of cities throughout Oregon.

Please note that when determining change in city population over time, the annexation table in this report should be consulted to help explain possible reasons for the magnitude of change. In addition, please check the Population Research Center's quarterly Population Supplement Report, available online, to find revised populations due to annexations or enumerations that were conducted since the publication of this report.

State Requirements for Population Estimates and the History of the Population Research Center

Oregon law (Oregon Revised Statutes 190.510 to 190.610) mandates the Population Research Center, Portland State University, acting on behalf of the State Board of Higher Education, to prepare annual population estimates for each county and incorporated city in the state of Oregon. The principal purpose of the population estimates is for the allocation of selected State funds to Oregon's cities and counties.

The State government organized a State Census Office in Portland in 1956. The purpose of the State Census Office was to oversee and certify special censuses that rapidly growing towns conducted in order to document their population figures. The State Census Office eventually expanded its role to include the certification of the population added by annexations and the preparation of annual population estimates for counties and cities.

Administrative responsibilities for the population estimates were transferred to Portland State University's Center for Population Research and Census in 1965, when Portland State College became a university. The Center for Population Research and Census, now known as the Population Research Center (PRC), is located in the Toulan School of Urban Studies and Planning within the College of Urban and Public Affairs.

Duties of the Population Center

In addition to preparing the annual population estimates, PRC houses the Oregon State Data Center, the lead agency in Oregon for contact and collaboration with the U.S. Census Bureau and for dissemination of census data and documents. This information includes current and past census data for Oregon as well as results from Census Bureau surveys.

PRC conducts research with a focus on the investigation of the causes and consequences of demographic change in today's society. Typical research areas include social and economic factors affecting demographic change, population distribution and migration, population geography, survey investigation on population issues, enrollment forecasts for school districts, community assessment for special needs programs, and demographic methods. PRC staff regularly assist and provide demographic data and analysis to city, county, and state government agencies and other community partners. The primary geographic areas of study for PRC staff are in Oregon and Washington.

Population Research Center staff teach in the Toulan School of Urban Studies and Planning, College of Urban and Public Affairs. The School of Urban Studies and Planning offers a graduate certificate program in applied demography, an applied demography curriculum in the Master of Urban Studies degree program, and a graduate concentration in applied demography in the Ph.D. program.

Methods for Population Estimates

All residents of Oregon's cities, counties, and unincorporated areas are included in the population estimates. Residents include people living in housing units (single-family and multi-family units, mobile homes, special housing units (such as boats, tents, motel rooms), and group quarter facilities (such as college dormitories, nursing homes, jails and prisons). We count residents as persons living at the place that they consider to be their usual residence, or where they are residing at least 6 months of the year.

We have developed methods for Oregon's population estimates to be as accurate as possible. Toward this goal, we work closely with state, county, and city officials, requesting annual information from them and inviting their review of our methods and estimates.

To estimate the State population, we use the following equation that defines population in 2006 as the population in 2000 plus the sum of two basic components: natural increase and net migration during 2000 to 2006*.

$$Pop._{(06)} = Pop._{(00)} + Nat.\ Incr._{(00\text{-}06)} + Net\ Mig._{(00\text{-}06)}$$

We rely on the registration of births and deaths to estimate Oregon's natural increase (the number of births minus deaths). To estimate the net migration (in-migrants minus out-migrants), we use school enrollment, employment, labor force, state income tax exemption, voter registration, and Medicare data. We utilize a method, called ratio correlation, that relates the changes in these data since the last census to changes in net migration during the same time period.

We use two methods to estimate county population: 1) a ratio correlation method, and 2) a modified component method. In the ratio correlation method, we track changes in state income tax exemptions, school enrollment, the number of births, and Medicare enrollment data to make an estimate of the current county populations. In the component method, we determine the natural increase for each county, and estimate net migration based on recent historical trends. In addition, we examine changes in the housing stock to verify the accuracy of the county estimates.

We develop population estimates for Oregon's cities according to the changes in their housing stock and group quarters population. City officials report each year on the changes in their city's housing stock (for single-family units, multi-family units, and mobile homes) and the number of persons residing in group quarters. We also take into account any population changes that have been due to annexations. In addition, we make any appropriate adjustments to the average number of people per housing unit for individual cities and use this information to prepare the city's final population estimate.

The number of persons residing in the county unincorporated areas are estimated by calculating the residual of the estimate of the county population and the sum of the city population total in the same county. Adjustments may be made according to recent data on housing growth and changes in group quarter population that county officials provide us.

We monitor city annexations throughout the year. We are notified about annexations by the office of the Secretary of State. When an annexation occurs, we contact city officials to request the number of residential housing units and population, if any, that were involved in the annexation. If the annexation added people to the city's population, then we certify an updated city population, which is done on a quarterly basis. The Secretary of State's office is informed of any revised populations in a special notification that we send. In addition, each quarter we publish online the revised populations in a supplement to our annual population estimates report.

We prepare preliminary July 1 population estimates for Oregon and its cities and counties in mid-November each year. At that time the preliminary estimates are made available to the public. Based on reviews that we receive from state, city and county officials and other community partners, we may adjust the annual population estimates, and then release the final figures in December. We publish the state, city and county estimates on our website (www.pdx.edu/prc) shortly after. This annual population report, which includes the complete set of population estimates, is usually available online by March the following year.

Acknowledgements

This report was prepared under the general direction of Risa Proehl, manager of the Population Research Center's Population Estimates Program. Professional consultation was provided by Dr. George Hough, Jr., Director of the Population Research Center, and review of the estimates was performed by Population Research Center staff, and community partners around the State. Lisa Yarbrough provided help on report compilation and distribution.

*Natural increase and net migration are estimated for the fiscal year, beginning July 1 in one year and ending June 30 in the following year.

Exhibit K: City of Banks, Oregon; Inventory of Existing Water Rights
1 page

City of Banks, Oregon

Exhibit "K"

INVENTORY OF EXISTING WATER RIGHTS

Ground Water

Application/Permit Number	Certificate Number	Source	Use	Priority Date	Authorized Amount of water	Max Amount of Beneficial Water Use	*Use Limitations
G8476/G7593	n/a	A well, West Fork Dairy Creek	Municipal	9/29/1977	0.67 cfs	0.613cfs	Well produces lower than expected yield

Surface Water

Application/Permit Number	Certificate Number	Source	Use	Priority Date	Authorized Amount of water	Max Amount of Beneficial Water Use	*Use Limitations
S9207/S6516	5353	Spring, tributary of Dairy Creek	Municipal	4/3/1923	0.42 cfs	0.42 cfs	
S65611/S48173	83138	Unnamed spring, West Fork Dairy Creek	Municipal	8/25/1983	0.180 cfs	0.180 cfs	Seasonal unavailability, high turbidity

Pending Applications

Application/Permit Number	Certificate Number	Source	Use	Priority Date	Authorized Amount of water	Max Amount of Beneficial Water Use	***Use Limitations**
G15887	n/a	Well, in West Fork Dairy Creek Basin	Municipal	12/05/2002	1.0 requested	n/a	

Pending Transfer Applications

Transfer/Application /Permit Number	Certificate Number	Source	Use	Priority Date	Authorized Amount of water	Max Amount of Beneficial Water Use	***Use Limitations**
T10055**/G8476/G7593	n/a	A well, Tributary to East Fork Dairy Creek Basin	Municipal	9/29/1977	n/a	n/a	

***If a particular water right certificate, permit, or transfer is not being utilized to meet current demands or its use is limited, please explain why.**

**** T-10055 is a Permit Amendment, requesting an additional point of appropriation for Permit G7593.**

Oregon Water Resources Department
Water Rights Division

Application for Extension of Time

In the Matter of the Application for an Extension of Time for Permit G-7593, Water Right Application G-8476, in the name of the City of Banks	)))	PROPOSED FINAL ORDER

Permit Information

Application File G-8476 / Permit G-7593

Basin 02 – Willamette Basin / Watermaster District 18

Date of Priority: September 29, 1977

Authorized Use of Water

Source of Water: A well in the Willamette Basin

Purpose or Use: Municipal

Maximum Rate: 0.67 Cubic Feet per Second, from the Behrman Well

This Extension of Time request is being processed in accordance with Oregon Administrative Rule Chapter 690, Division 315.

Please read this Proposed Final Order in its entirety as it contains additional conditions not included in the original permit.

This Proposed Final Order applies only to Permit G-7593, water right Application G-8476. A copy of Permit G-7593 is enclosed as Attachment 1.

Summary of Proposed Final Order for Extension of Time

The Department proposes to:

- grant an extension of time to complete construction of the water system from October 1, 1979 to October 1, 2017;
- grant an extension of time to apply water to full beneficial use from October 1, 1980 to October 1, 2017; and

ACRONYM QUICK REFERENCE

Department – Oregon Department of Water Resources
City – City of Banks
ODFW – Oregon Department of Fish and Wildlife
PFO – Proposed Final Order
WMCP – Water Management and Conservation Plan

Units of Measure
cfs – cubic feet per second
gpm – gallons per minute
mgd – million gallons per day

AUTHORITY

Generally, see ORS 537.630 and OAR Chapter 690 Division 315.

ORS 537.630(2) provides in pertinent part that the Oregon Water Resources Department (Department) may, for good cause shown, shall order and allow an extension of time, for the completion of the well or other means of developing and securing the ground water or for complete application of water to beneficial use. In determining the extension, the department shall give due weight to the considerations described under ORS 539.010 (5) and to whether other governmental requirements relating to the project have significantly delayed completion of construction or perfection of the right.

ORS 539.010(5) provides in pertinent part that the Water Resources Director, for good cause shown, may extend the time within which the full amount of the water appropriated shall be applied to a beneficial use. This statute instructs the Director to consider: the cost of the appropriation and application of the water to a beneficial purpose; the good faith of the appropriator; the market for water or power to be supplied; the present demands therefore; and the income or use that may be required to provide fair and reasonable returns upon the investment.

OAR 690-315-0080 provides in pertinent part that the Department shall make findings to determine if an extension of time for municipal and/or quasi-municipal water use permit holders may be approved to

complete construction and/or apply water to full beneficial use. Under specific circumstances, the Department may condition extensions of time for municipal water use permit holders to provide that use of the undeveloped portion of the permit maintains the persistence of listed fish species in the portions of the waterways affected by water use under the permit.

OAR 690-315-0090(3) authorizes the Department, under specific circumstances, to condition an extension of time for municipal and/or quasi-municipal water use permit holders to provide that diversion of water beyond the maximum rate diverted under the permit or previous extension(s) shall only be authorized upon issuance of a final order approving a Water Management and Conservation Plan under OAR Chapter 690, Division 86.

FINDINGS OF FACT

Background

1. Permit G-7593 was granted by the Department on December 2, 1977. The permit authorizes the use of up to 0.67 cfs of water from one well (Behrman Well) within the Willamette Basin, for municipal use. It specified that construction of the water development project was to be completed by October 1, 1979, and that complete application of water was to be made on or before October 1, 1980.

2. No prior extensions have been granted for the permit. This is the first extension of time request for Permit G-7593.

3. Due to an ongoing permit extension rulemaking, the Department placed all pending Applications for Extension of Time for municipal and quasi-municipal permits on hold and did not require municipal and quasi-municipal water use permit holders to submit Applications for Extension of Time until the new rules were adopted.

4. Municipal and quasi-municipal water use permit extension rules OAR 690-315-0070 through 690-315-0100 became effective on November 1, 2002, were amended, filed with the Secretary of State, and became effective on November 22, 2005.

5. The permit holder, the City of Banks, (City) submitted an "Application for Extension of Time" to the Department on May 17, 2007, requesting the time in which to apply water to full beneficial use under the terms of Permit G-7593 be extended from October 1, 1979 to October 1, 2017.

6. Notification of the City's Application for Extension of Time for Permit G-7593 was published in the Department's Public Notice dated May 22, 2007. No public comments were received regarding the extension application.

Review Criteria for Municipal Quasi-Municipal Water Use Permits [OAR 690-315-0080(1)]

The time limits to complete construction and/or apply water to full beneficial use may be extended if the Department finds that the permit holder has met the requirements set forth under OAR 690-315-0080. This

determination shall consider the applicable requirements of ORS 537.230[1], 537.248[2], 537.630[3] and/or 539.010(5)[4]

Complete Extension of Time Application [OAR 690-315-0080(1)(a)]

7. On May 17, 2007, the Department received a completed Application for Extension of Time and the fee required by ORS 536.050 from the permit holder.

Start of Construction [OAR 690-315-0080(1)(b)]

8. Ground water permits held by municipal corporations for municipal purposes are not subject to the requirement to begin actual construction work within one year from the date of approval of the application.[5]

Duration of Extension [OAR 690-315-0080(1)(c)(d)]

Under OAR 690-315-0080(1)(c),(d), in order to approve an extension of time for municipal and quasi-municipal water use permits the Department must find that the time requested is reasonable and the applicant can complete the project within the time requested.

9. The remaining work to be accomplished under Permit G-7593 consists of completing construction of the water system and completing application of water.

10. As of June 13, 1980, the permit holder has appropriated 0.613 cfs of the 0.67 cfs of water authorized under Permit G-7593 for municipal purposes.

11. In addition to Permit G-7593, the City of Banks holds surface water permits totaling 0.33 million gallons per day (mgd). One permit is for 0.42 cfs of water from a spring that is a tributary of Dairy Creek (Certificate 5353 and Permit S-6516) and the other permit is for 0.180 cfs of water from an unnamed spring west of Fork Dairy Creek (Certificate 83138 and Permit S-48173). Seasonal limitations and senior water rights held by surrounding areas restrict the City's available surface water supply during peak summertime demands. These surface water sources also have the potential to be disrupted by natural hazards such as forest fires, earthquakes and volcanic eruptions.

---

[1] ORS 537.230 applies to surface water permits only.

[2] ORS 537.248 applies to reservoir permits only.

[3] ORS 537.630 applies to ground water permits only.

[4] ORS 537.010(5) applies to surface water and ground water permits.

[5] Section 5, chapter 410, Oregon Laws 2005, provides:

Sec. 5. (2) The amendments to ORS 537.230 and 537.630 by sections 1 and 2 of this 2005 Act apply to requests for extensions of time to complete construction or to perfect a water right made before, on or after the effective date of this 2005 Act, whether or not construction has commenced under a permit prior to the request.

(3) All final orders by the department that resulted in the issuance of a water right permit, the issuance of a water right certificate or the approval of an extension of time to complete construction or to perfect a water right for a municipal use that were issued before the effective date of this 2005 Act are not subject to challenge in an administrative or judicial proceeding with respect to the requirement to commence and complete construction within a specified period of time. [2005 c.410 §5]

12. To meet immediate short-term demands, the City felt it necessary to submit a request proposing to amend a ground water right by adding a well with pumping capacity to the permit as an additional point of appropriation.

    This permit amendment (T-10055) cannot be approved by the Department until this extension is granted.

13. In order to respond to emergency water situations and to maintain sufficient future water supply, the City plans to fully develop the wells under Permit G-7593 through this extension of time and a subsequent permit amendment (T-10055) proposing to add an additional point of appropriation (well). With the addition of the ground water authorized under Permit G-7593, the remaining 0.057 cfs could be provided, putting the water to full beneficial use.

14. The current population within the service boundary of Banks is 1435 and is expected to increase, reaching a population of 3739 by the year 2024.

15. The City currently utilizes a peak day demand total of 0.33 million gallons per day of water within its own service boundary. This demand is currently met by water from ground water and surface water permits.

16. The City's projected peak day demand has not been developed because of a vacancy in the City Engineer position.

17. Full development of Permit G-7593 is needed to address the present and future water demand of the City.

18. The City's request for an extension of time until October 1, 2017 to complete construction of the water system and to apply water to full beneficial use under the terms of Permit G-75693 is both reasonable and necessary, considering findings in this PFO, including:

    - The amount of development left to occur;
    - The City's projected annual growth rate and associated projected demands for water;
    - The need for redundancy and emergency water supply needs of the City; and
    - The reliability of the other water rights held by the City.

Good Cause [OAR 690-315-0080(1)(e) and (3)(a-g)and (4)]

The Department's determination of good cause shall consider the requirements set forth under OAR 690-315-0080(3).

Reasonable Diligence and Good Faith of the Appropriator [OAR 690-315-0080(3)(a),(c) and (4)]

Reasonable diligence and good faith of the appropriator must be demonstrated during the permit period or prior extension period as a part of evaluating good cause in determining whether or not to grant an extension. In determining the reasonable diligence and good faith of a municipal or quasi-municipal water use permit holder,

the Department shall consider activities associated with the development of the right including, but not limited to, the items set forth under OAR 690-315-0080(4) and shall evaluate how well the applicant met the conditions of the permit or conditions of a prior extension period.

19. During the original development time frame under Permit G-7593, being from October 1, 1979 October 1, 1980, the following work was completed by the City:

- The City completed construction of the Behrman well;
- Constructed 6-inch transmission pipes; and
- Constructed reservoirs for storage of ground water.

20. Since October 1, 1980, the City has accomplished the following:

- The City completed construction of a second well;
- Obtained Department approval of a Water Management and Conservation Plan consistent with OAR Chapter 690, Division 86;
- Installed water meters at user sites and established other water conservation programs and activities;
- Installed fish screens; and
- Submitted a permit amendment to the Department proposing to add an additional point of appropriation under Permit G-7593.

21. As of May 17, 2007, the permit holder has invested 89 percent of the total projected cost for complete development of this project, being an approximate total of $1,686,785.

22. Since the issuance of Permit G-7593 on December 2, 1977, approximately 0.613 cfs of the 0.647 cfs allowed has been appropriated from the Behrman Well for beneficial municipal purposes under the terms of this permit.

23. The Department has considered the City's compliance with conditions, and did not identify any concerns.

Financial Investment and Cost to Appropriate and Apply Water to a Beneficial Purpose
[OAR 690-315-0080(3)(b)]

24. As of May 17, 2007, the City has invested an approximate total of $1,686,785 into the project for the following:

- The City completed construction of two wells;
- Obtained Department approval of a Water Management and Conservation Plan consistent with OAR Chapter 690, Division 86;
- Constructed 6-inch transmission pipes;
- Constructed reservoirs for storage of ground water;
- Installed water meters at user sites and established other water conservation programs and activities; and
- Submitted a permit amendment to the Department proposing to add an additional

point of appropriation under Permit G-7593.

The City anticipates an additional $200,000 is needed for the completion of this project.

The Market and Present Demands for Water [OAR 690-315-0080(3)(d)]

25. As described in Findings 9 through 24 the City has indicated, and the Department finds that the City must rely on full development of all its current ground water rights and surface water rights within the Willamette Basin.

26. The City projects a consistent population increase over the next eighteen years based on Portland State University Population Research Center estimates. The City expects commercial and industrial growth to be similar and proportionate to their residential growth.

27. Given the current water supply situation of the City, as well as current and expected demands, there is a market and present demand for the water to be supplied under Permit G-7593.

28. The City of Banks is currently in a position where their peak demands for water are only slightly less than their current available water supply capacity. Allowing an extension of time would allow the City to complete a permit amendment adding an addition point of appropriation to put the permit to full beneficial use.

Fair Return Upon Investment [OAR 690-315-0080(3)(e)]

29. Use and income from the permitted water development project wouldresult in reasonable returns upon the investment made in the project to date.

Other Governmental Requirements [OAR 690-315-0080(3)(f)]

30. Delay in the development of this project was caused, in part, by the requirement of a sand filtration plant in response to the Federal Surface Water Treatment Rule enacted in 1986. The City commissioned a study and construction of the sand filtration plant that cost over $635,000 and was completed in 1997.

Events which Delayed Development under the Permit [OAR 690-315-0080(3)(g)

31. Unforeseen events extended the length of time needed to fully develop and perfect Permit G-7593. One of the primary reasons for delay was the Behrman well performing below original specifications with a lower than expected yield. A recent increase in population has also increased water demands, especially during peak summer months. To meet these demands, the City has been exceeding the recommended maximum daily running time of the pump for Behrman well. A third factor influencing the delayed development includes the City's limited financial resources that have been used to maintain and upgrade the existing water system. These repairs ensured the quality of drinking water and reduced leakage.

Severe weather in 1996, which included flooding and mudslides, damaged the City's water intake structure that cost approximately $189,000 to rebuild. Other expenses were incurred as a

result of meeting the Federal Surface Water Treatment Rule that required the City to build a slow sand filtration plant. The construction of the plant that was completed in 1997 cost over $635,000 of the City's financial resources.

The City purchased "Kelly Field" in order to reduce the risk of contamination of the water supply as a result of private logging activities within the watershed. The purchase and subsequent replanting of the property cost approximately $436,000.

Maintaining the Persistence of Listed Fish Species [OAR 690-315-0080(1)(f) and (2)]

The Department's determination regarding maintaining the persistence of listed fish species shall be based on existing data and advice of the Oregon Department of Fish and Wildlife (ODFW). The determination shall be limited to impacts related to stream flow as a result of use of the undeveloped portion of the permit and further limited to where, as a result of use of the undeveloped portion of the permit, ODFW indicates that stream flow would be a limiting factor for the subject listed fish species.

32. On <Date of GW review> the Water Resources Department determined under OAR Chapter 690 Division 9, that use of water under this ground water Permit G-7593 does not have the potential for substantial interference with surface water.

33. Based upon the Department's determination described in Finding 32, the use of the undeveloped portion of Permit G-7593 does not have the potential for substantial interference with surface water, and therefore the persistence of listed fish species will be maintained.

CONCLUSIONS OF LAW

1. The City is entitled to apply for an extension of time to complete construction and/or completely apply water to the full beneficial use pursuant to ORS 537.630(2).

2. The City has submitted a complete extension application form and the fee specified under ORS 536.050(1)(k), as required by OAR 690-315-0080(1)(a).

3. Pursuant to Section 5, Chapter 410, Oregon Laws 2005, the permit holder is not required to demonstrate that actual construction of the project began within one year of the date of issuance of the permit, as otherwise required by OAR 690-315-0080(1)(b).

4. The time requested to complete construction and apply water to full beneficial use is reasonable, as required by OAR 690-315-0080(1)(c).

5. Completion of construction and full application of water to beneficial use can be completed by October 1, 2017[6] pursuant to OAR 690-315-0080(1)(d).

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[6] For permits applied for or received on or before July 9, 1987, upon complete development of the permit, you must notify the Department that the work has been completed and either: (1) hire a water right examiner certified under ORS 537.798 to conduct a survey, the original to be submitted as required by the Department, for issuance of a water right certificate; or (2) continue to appropriate water under the water right permit until the Department conducts a survey and

6. The Department has considered the reasonable diligence and good faith of the appropriator, the cost to appropriate and apply water to a beneficial purpose, the market and present demands for water to be supplied, the financial investment made and the fair return upon the investment, the requirements of other governmental agencies, and unforeseen events over which the water right permit holder had no control, and the Department has determined that the City has shown good cause for an extension of time to complete construction of the water system and to apply the water to full beneficial use pursuant to OAR 690-315-0080(1)(e).

7. Given the City's current water supply situation, the amount of development left to occur under Permit G-7593, the City's projected annual growth rate and associated projected demands for water, and considering the positive impacts from the City's conservation activities, the permittee's request to have until October 1, 2017, to complete construction of the water system and to complete the application of water to beneficial use under the terms of Permit G-7593 is reasonable, as required by OAR 690-315-0080(1)(c).

8. Given the City's current water supply situation and their existing and expected needs, there is a market and present demand for the water to be supplied under Permit G-7596.

9. After considering the reasonable diligence and good faith of the appropriator, the financial investment made, the market and present demands for water, the fair return upon the investment, the requirements of other governmental agencies and uncontrollable events which delayed development under the permit, the Department has determined that the applicant has shown good cause for an extension to complete construction of the water system and to complete the application of water to full beneficial use pursuant to OAR 690-315-0080(1)(e).

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issues a water right certificate under ORS 537.625.

Proposed Order

Based upon the foregoing Findings of Fact and Conclusions of Law, the Department proposes to issue an order to:

Extend the time for complete construction of the water system under Permit G-7593 from October 1, 1980, to October 1, 2017; and

Extend the time for complete application of water to beneficial use under Permit G-7593 from October 1, 1980, to October 1, 2017.

DATED: August 10, 2007

If you have any questions, please check the information box on the last page for the appropriate names and phone numbers.

Dwight French
Administrator
Water Rights and Adjudications Division

Proposed Final Order Hearing Rights

1. Under the provisions of OAR 690-315-0100(1) and 690-315-0060, the applicant or any other person adversely affected or aggrieved by the proposed final order may protest and request a contested case hearing on the proposed final order. Your request for contested case hearing must be in writing and must be received by the Water Resources Department no later than September 24, 2007 being 45 days from the date of publication of the proposed final order in the Department's weekly public notice.

2. A written request for contested case hearing shall include:
   a. The name, address and telephone number of the petitioner;
   b. A description of the petitioner's interest in the proposed final order and if the protestant claims to represent the public interest, a precise statement of the public interest represented;
   c. A detailed description of how the action proposed in the proposed final order would adversely affect or aggrieve the petitioner's interest;
   d. A detailed description of how the final order is in error or deficient and how to correct the alleged error or deficiency;

e. Any citation of legal authority supporting the petitioner, if known;
f. Proof of service of the protest upon the water right permit holder, if petitioner is other than the water right permit holder; and
g. The protest fee required under ORS 536.050, if petitioner is other than the water right permit holder.

3. Within 60 days after the close of the period for requesting a contested case hearing, the Director shall:
   a. Issue a final order on the extension request; or
   b. Schedule a contested case hearing if a request for contested case hearing has been submitted, and:
      1) Upon review of the issues, the Director finds there are significant disputes related to the proposed agency action; or
      2) The applicant submits a written request for a contested case hearing within 30 days after the close of the period for submitting protests.

If you have any questions about statements contained in this document, please contact Ann L. Reece at 503-986-0808.

If you have questions about how to file a protest or if you have previously filed a protest and you want to know the status, please contact Mike Reynolds at 503-986-0820.

If you have any questions about the Department or any of its programs, please contact our Water Resources Customer Service Group at 503-986-0801.

Address any correspondence to: Water Rights and Adjudications Division
725 Summer St NE, Suite A
Fax: 503-986-0901 Salem, OR 97301-1266

Mailing List for Extension PFO Copies

PFO Date: August 10, 2007

Permit G-7593
Application G-8476

Original mailed to Applicant:

City of Banks
Attn: Mayor Teri Branstitre
100 S. Main Street
Banks, OR 97106

Copies Mailed

By:
(SUPPORT STAFF)

Copies sent to:

1. WRD - Appl. File G- 8476 / Permit G-7593

2. WRD - Watermaster District 18 – Darrell Hedin

3. ODFW - Dist # 2 - Name of ODFW Biologist

4. DEQ - Northwest Region and Western Region only

Other interested parties:

5. Colm Moore, Attorney
Schroeder Law Offices, P.C.
1915 NE 39th Avenue
Portland, OR 97212

Fee paid as specified under ORS 536.050 to receive copy:

6. None

Receiving via e-mail (10 AM Tuesday of signature date)

7. Static Water Level Decline Levels Triggered (or close to triggering) ☐ YES ☐ NO

   If YES..... send an e-mail to the watermaster identifying the extent of static water level decline.

8. PFO: WRD – Watermaster District 16 – Mike McCord, Salem
   *Done by*_____*Date*_____

9. Notification only: WRD – Salem Opeifa and Gerry Clark (if Reimbursement Authority)
   *Done by*_____*Date*_____

CASEWORKER: ALR

Final Deliverables Cover Sheet
for
Permit Extension of Time Applications

Application #: G-8476 **Permit #:** G-7593

Name of Permit Holder: City of Banks

The following items are enclosed:

☑ **The completed Extension of Time Completeness Checklist;**

☑ **The completed Extension of Time Proposed Final Order Checklist;**

☑ **All background information and notes used to make the extension determination;**

☑ **A hard copy of the Extension of Time documents:**
- a. Letter(s) requesting additional/missing information *(if applicable)*
- b. Proposed Final Order and Mailing List
- c. Final Order and Mailing List

☑ **An electronic copy of the Extension of Time documents***
- a. Letter(s) requesting additional/missing information *(if applicable)*
- b. Proposed Final Order and Mailing List
- c. Final Order and Mailing List

NOTE:	**WRD will only accept electronic copies in the following programs:** **a. WordPerfect, or** **b. MS Word - "rich text" format only**

☐ **Signature of Contractor:** _____ **Date:** 08/28/07

For WRD use only:

WRD approval by: _____ **Date:** _____

RECEIVED
AUG 31 2007
WATER RESOURCES DEPT
SALEM OREGON

Application # G-8476 / **Permit #** G-7593

Permit Holder: CITY OF BANKS

Drainage Basin: WILLAMETTE #2 *Watermaster Name and #:* 18 - DARREN NEDIN

Place a (✓) in the box if the item is satisfied	**Division 315 - Municipal/Quasi-Municipal Extension of Time - Completeness Checklist OAR 690-315-0070(3)**
✓	*1. [OAR 690-315-0070(3)]* The appropriate extension of time fee (as specified in ORS 536.050). **$100** - applications received by September 30, 2003 / (**$250**) - applications received on or after October 1, 2003 Duplicate Fees Paid? _____
✓	** [OAR 690-315-0070(3)(a)]* The name and mailing address of the water right permit holder(s);
✓	** [OAR 690-315-0070(3)(b)]* The application number and the permit number for which an extension is requested;
N/A	*2-A. [OAR 690-315-0070(3)(c)]* For ***Quasi-Municipal*** water use permit holders, evidence of the actions taken to begin actual construction on the project, as defined in 690-315-0020(3)(d), if required under the applicable statute; • "Actual construction" means physical work performed toward completion of the water system, which demonstrates both the present good faith of the water right permit holder and the water right permit holder's intention to complete the project with reasonable diligence; • "Actual construction" does not include planning a diversion system, formulating a business plan, securing financing, letting contracts, purchasing but not installing equipment, or surveying. Date permit issued: ~~12-2-77~~ *(NOTE: Municipal and Quasi-Municipal permits issued after 11/2/98 are also subject to review under 690-315-0080(5)... See PFO Checklist)* "A" date: _____ "B" date: _____ "C" date: _____ "A" Date Met? **YES** or **NO**
✓	*2-B. [OAR 690-315-0070(3)(d)]* - For ***Municipal*** water use permits issued on or after June 29, 2005, evidence of the actions taken to begin actual construction on the project, as defined in 690-315-0020(3)(d); • "Actual construction" means physical work performed toward completion of the water system, which demonstrates both the present good faith of the water right permit holder and the water right permit holder's intention to complete the project with reasonable diligence; • "Actual construction" does not include planning a diversion system, formulating a business plan, securing financing, letting contracts, purchasing but not installing equipment, or surveying. Date permit issued: 12-2-77 *(NOTE: Municipal and Quasi-Municipal permits issued after 11/2/98 are also subject to review under 690-315-0080(5)... See PFO Checklist)* "A" date: 12-2-78 "B" date: 10-1-79 "C" date: 10-1-80 "A" Date Met? (**YES**) or **NO**
✓	*3. [OAR 690-315-0070(3)(e)]* - This is extension request # 1 Evidence of actions taken to develop the right within the original permitted time period ***OR***, during the most recent extension period from _____ to _____
✓	*4. [OAR 690-315-0070(3)(f)]* Evidence of compliance with conditions contained in the permit and any previous extension(s) or the reason the condition was not satisfied; METER INSTALLED WATER MEASUREMENTS TAKEN
✓	*5. [OAR 690-315-0070(3)(g)]* Evidence of the maximum INSTANTANEOUS rate (or duty if applicable) of diversion for beneficial water use, if any, made to date; 0.613CFS on well log (1977) 275 gpm × 1 cfs / 448.83 gpm = .613 CFS
✓	*6. [OAR 690-315-0070(3)(h)]* An estimate of the population served and a description of the methodology(ies) used to make the estimate; 1876

Place a (✓) in the box if the item is satisfied	**Division 315 - Municipal/Quasi-Municipal Extension of Time - Completeness Checklist OAR 690-315-0070(3)**
✓	*7. [OAR 690-315-0070(3)(i)]* A description of financial expenditures made toward completion of the water development; $1,686,785 1,576,785 - 1,686,785
✓	*8. [OAR 690-315-0070(3)(j)]* An estimate of the cost to complete the water development; $200,000
✓	*9. [OAR 690-315-0070(3)(k)]* A summary of any events that delayed completion of the water development or application of water to full beneficial use, including other governmental requirements, if any, relating to the project that have significantly delayed completion of construction or perfection of the right; Behrman well below specs, rapid growth of city, limited finances, severe weather in 1996, gov't requirements, purchase of land to prevent contamination
✓	*10. [OAR 690-315-0070(3)(l)]* **PART A:** An estimated demand projection and a description of the methodology(ies) used for the subject water right permit, considering the other water rights held by the municipal or quasi-municipal water use permit holder, and a date by which the water development is anticipated to be completed and water put to full beneficial use. Current Peak Water Demands: .33MGD Projected Population: 3739 BY 2024 Potential Growth: could expand to surrounding areas Inventory of Water Rights Held: EXHIBIT K permit G7593 just to meet current demands **PART B:** Extension requests for greater than 50 years must include documentation that the demand projection is consistent with the amount and types of lands and uses proposed to be served by the permit holder.
✓	*11. [OAR 690-315-0070(3)(m)]* A summary of the applicant's plan and schedule to complete construction and/or perfect the water right; within several months after bidding process and approval of T-1055
✓	*12. [OAR 690-315-0070(3)(n)]* Justification for the time requested to complete the project and/or apply the water to full beneficial use; PERMIT AMENDMENT
✓	*13. [OAR 690-315-0070(3)(o)]* Any other information the applicant determines is relevant to evaluate the application in accordance with applicable statutes and rules;
✓	* *[OAR 690-315-0070(3)(p)]* Any other information required by the Department that is necessary to evaluate the application in accordance with applicable statutory requirements.
O	*[OAR 690-315-0070(3)(q)]* ***For Municipal water use permits issued on or before November 2, 1998:*** **for the first extension issued after June 29, 2005,** the completed application must include a copy of any agreements regarding the use of the undeveloped portion of the permit between the permit holder and a federal or state agency that include conditions or required actions that maintain the persistence of listed fish species in the portions of waterways affected by water use under the permit.
✓	* Signature(s) of the water right permit holder(s) or authorized agent.

S:\groups\wr\extensions\forms and templates\Completeness of Ext Appl\completeness checklist_div 315 muni.wpd

Name of Reviewer: Kim FRENCH **Date:** 5/17/07

Municipal or Quasi-Municipal

Extension PFO Checklist for Water Use Permits

issued on or prior to November 2, 1998

(OAR 690-315-0010 through OAR 690-315-0060)

Application: G - 8476 Permit: G - 7593

Permittee's Name: CITY OF BANKS

Permittee's Mailing Address: 100 MAIN ST, BANKS, OR 97106

POD Location: Township 2N Range 3W Section 31 ¼¼ NENW

Drainage Basin: 2 - WILLAMETTE County: WASHINGTON Watermaster District: 18

Date Permit was issued: 12-2-77 **Priority Date:** 9-29-77 **Date of PN:**

Source: A WELL

Use: MUNICIPAL

"Q": 0.613 CFS

Orig "A" Date: 12-2-78 **Orig "B" Date:** 10-1-79 **Orig "C" Date:** 10-1-80

Extension request received: 5-17-07 **Last Authorized "B" Date:** — **Last Authorized "C" Date:** —

Request Number (...1st 2nd, 3rd): 1 ST **Proposed "B" Date:** 10-1-2017 **Proposed C Date:** 10-1-2017

Conditions of Permit:

Condition Met?	Condition Not Met?	Permit Condition
X		INSTALL METER
X		FISH SCREEN

Factors to consider in determining "Reasonable Diligence" [OAR 690-315-0040(3)]:

Yes No

☑ ☐ Construction was completed within the time allowed in the permit or previous extension

☑ ☐ Beneficial use made of the water during the permit or previous extension time limits

- Permit holder has beneficially used .613 (cfs)/gpm/af of the total permitted quantity of water on N/A acres

☑ ☐ Water right permit holder conformed with the permit or previous extension conditions; and

☑ ☐ Financial investments were made toward developing the beneficial water use.

- Permit holder has invested approximately 89 % of the total estimated cost to complete the project.
- Amount Invested to date: $ 1,686,785 Estimated Remaining Cost: $ 200,000

Has the applicant pursued perfection of the right in good faith and with reasonable diligence? Yes ☑ No ☐

Application G - 8476 Permit G - 7593 Township 2N Range 3W Section 31

For MUNICIPAL permit ONLY. Maintaining persistence of state or federal listed fish species:

Yes No

- ☑ ☐ Is this a Municipal use Permit? (If **YES**, proceed. If **NO**, skip to "Good Cause")
- ☑ ☐ Was this permit issued on or prior to 11/2/98? (If **NO**… **STOP**. You are using the wrong form. Use *PFO Checklist MU/QM for permits issued after 1/2/98.*
- ☑ ☐ Is this the first extension issued since 6/29/05 (*effective date of HB 3038*)? (If **NO**…**STOP**. Indicate N/A and skip to "Good Cause" *[refer to OAR 690-315-0080(1)(f)]*
- ☐ ☐ If YES to above items, has ODFW reviewed extension application? No info indicating ODFW has reviewed
- ☐ ☐ Has ODFW recommended adding any conditions to the Extension PFO?
- ☐ ☐ Does the permit holder have any existing fish protection agreement with a state or federal agency? *(Refer to ODFW's review for this determination* _____ *)*

Based on the written record, can the Department make a finding of "Good Cause" to approve the extension request?

Yes... "Good Cause" can be found. ☑ Approval of Extension Request

No ... "Good Cause" *cannot* be found. ☐ Denial of Extension Request

Conditions to be included in Extension PFO (if applicable)? Yes ☐ No ☐

*(**NOTE:** Check the file record for documentation to add a condition(s) at the extension stage.)*

☐ Max "Q" Development Limitations and Div. 856 Water Management and Conservation Plan

☐ Other: _____

Footnote regarding Claim of Beneficial Use. Choose the appropriate language below and insert as a footnote in the PFO:

☑ **COBU Requirement - Surface/Ground Water - on or prior to July 9, 1987**

"For permits applied for or received on or before July 9, 1987, upon complete development of the permit, you must notify the Department that the work has been completed and either: (1) Hire a water right examiner certified under ORS 537.798 to conduct a survey, the original to be submitted as required by the Water Resources Department, for issuance of a water right certificate; or (2) Continue to appropriate water under the water right permit until the Water Resources Department conducts a survey and issues a water right certificate under ORS 537.250 or 537.625."

☐ **COBU Requirement - Surface Water - post July 9, 1987**

"Pursuant to ORS 537.230(3), upon the completion of beneficial use of water allowed under the permit, the permittee shall hire a certified water rights examiner to survey the appropriation. Within one year after the complete application of water to a beneficial use (or by the date allowed for the complete application of water to a beneficial use), the permittee shall submit a map of the survey and the claim of beneficial use."

☐ **COBU Requirement - Ground Water - post July 9, 1987**

"Pursuant to ORS 537.630(3), upon the completion of beneficial use of water allowed under the permit, the permittee shall hire a certified water rights examiner to survey the appropriation. Within one year after the complete application of water to a beneficial use (or by the date allowed for the complete application of water to a beneficial use), the permittee shall submit a map of the survey and the claim of beneficial use."

NOTES:

Extension "PFO" Dates

Mailing / Issuance Date: _____ **Protest Deadline Date:** _____

Reviewer's Name: _____ **Date:** _____

Oregon Water Resources Department
Water Rights Division

Water Rights Application
Number G-8476

Final Order
Extension of Time for Permit Number G-7593

Appeal Rights

This is a final order in other than contested case. This order is subject to judicial review under ORS 183.484. Any petition for judicial review must be filed within the 60 day time period specified by ORS 183.484(2). Pursuant to ORS 536.075 and OAR 137-004-0080 you may either petition for judicial review or petition the Director for reconsideration of this order. A petition for reconsideration may be granted or denied by the Director, and if no action is taken within 60 days following the date the petition was filed, the petition shall be deemed denied.

Application History

The Department issued Permit G-7593 on December 2, 1977. The permit called for completion of construction by October 1, 1979, and complete application of water to beneficial use by October 1, 1980. On May 17, 2007, the City of Banks submitted an application to the Department for an extension of time for Permit G-7593. In accordance with OAR 690-315-0050(2), on August 1, 2007, the Department issued a Proposed Final Order proposing to extend the time to fully apply water to beneficial use to October 1, 2017. The protest period closed Tuesday June 26, 2007, in accordance with OAR 690-315-0060(1). No protest was filed.

At time of issuance of the Proposed Final Order the Department concluded that, based on the factors demonstrated by the applicant, the permit may be extended subject to no additional conditions.

The applicant has demonstrated good cause for the permit extension pursuant to ORS 537.630, 539.010(5) and OAR 690-315-0040(2).

Order

The extension of time for Application G-8476, Permit G-7593, therefore, is approved. The deadline for applying water to full beneficial use is extended to October 1, 2017.

DATED: [redacted], 2007

_____
Dwight French, Administrator of
Water Rights and Adjudications
for
Phillip C. Ward, Director

If you have any questions about statements contained in this document, please contact Ann L. Reece at (503) 986-0808.

If you have other questions about the Department or any of its programs, please contact our Water Resources Customer Service Group at (503) 986-0900

NOTE: Include a copy of the "Important Notice" document along with the original copy of the Final Order being sent to the permit holde

Mailing List for Extension FO Copies

Application G-8476 **FO Date: [redacted], 2007**
Permit G-7593

Original mailed to permit holder:

City of Banks
Attn: Mayor Teri Branstitre
100 S. Main Street
Banks, OR 97106

[redacted]

Copies sent to:

1. WRD - Appl. File G-8476/ Permit G-7593
2. WRD - Watermaster District 18, Darrell Hedin, Hillsboro
3. WRD – Region Regional Manager, Name
   NOTE: Do not send FO's to South Central Region (Kyle Gorman)
4. WRD- Ken Starr
5. WRD – Brook Geffen, Permit Amendments (extensions)
6. WRD - Support Staff, Salem...*Permit record update*

Fee paid as specified under ORS 536.050 to receive copy:

Colm Moore, Attorney
Schroeder Law Offices, P.C.
1915 NE 39th Avenue
Portland, OR 97212

Receiving via e-mail (10 AM day of signature date)

7. WRD – Water Master District 18 – Darrell Hedin, Hillsboro

CASEWORKER: **ALR**

Document1

DAVID J. NEWTON ASSOCIATES, INC.
1201 SW 12th Avenue, Suite 620
PORTLAND, OREGON 97205
(503) 228-7718

JOB City of Banks
SHEET NO. 1 OF 1
CALCULATED BY _____ DATE 7-2007
CHECKED BY _____ DATE _____
SCALE _____

need pump design criteria — apply to landscape use

- well to supplement supply of springs — 300 gpm ≈ not to exceed .67 cfs

WSMP ? don't have
(water system master plan)

$$.67 \text{ cfs} = \frac{448.83 \text{ gpm}}{1 \text{ cfs}} = 300.7 \text{ gpm}$$

$$250 \text{ gpm} = \frac{1 \text{ cfs}}{448.83 \text{ gpm}} = .557 \text{ cfs}$$

well test ☆ 275 gpm = .613 cfs
on log

$$250 \frac{\text{gal}}{\text{m}} \times \frac{60 \text{ min}}{1 \text{ hr}} \times \frac{24 \text{ hr}}{\text{day}} = 360{,}000 \text{ gpd}$$

peak water demand. — mil gal per day

.613 cfs
.42 cfs
.180 cfs

$$1.23 \text{ cfs} \times \frac{646315 \text{ gpd}}{1 \text{ cfs}} = 783{,}980.09 \text{ gpd}$$

1,686,785 already spent ~89%
200,000 remaining
1886,785 total

Laura A. Schroeder
Licensed in Oregon, Idaho, Nevada and Washington

V. Scott Borison, Ph.D.
Certified Legal Manager

Daryl N. Cole
Office Manager

SCHROEDER
LAW OFFICES, P.C.

Lynn L. Steyaert
Licensed in Oregon and Nevada

Cortney D. Duke
Licensed in Oregon

Colm Moore
Licensed in Oregon and Nevada

Therese A. Ure
Licensed in Nevada

Wyatt E. Rolfe
Licensed in Oregon

May 16, 2007

VIA US MAIL

Oregon Water Resources Department
725 Summer Street N.E. Suite A
Salem, OR 97301-4172
Attn: Water Right Permit Extensions/Kim French

RE: Application for Extension of Time for Municipal and Quasi-Municipal Water Use Permits, Application G-8476, Permit G-7593

Dear Ms. French:

Enclosed please find the City of Banks' Application for Extension of Time for Municipal and Quasi-Municipal Water Use Permits for Application G-8476, Permit G-7593, with Exhibits A – K attached. In addition, we have included the City of Banks' Reimbursement Authority Estimate Application. We have enclosed our firm check in the amount of $250.00 for the extension application, and a separate check in the amount of $125.00 for the reimbursement authority request.

If you have any questions regarding this application, please contact attorney Colm Moore or paralegal Tara Jackson of this office at (503) 281-4100.

Very truly yours,
SCHROEDER LAW OFFICES, P.C.

Brooke A. Carlock

Brooke A. Carlock
Paralegal

KCT:dnc
Enclosures

cc: Client

RECEIVED
MAY 17 2007
WATER RESOURCES DEPT
SALEM, OREGON

phone 503-281-4100 fax 503-281-4600
1915 NE 39th Avenue, P.O. Box 12527, Portland, Oregon 97212-0527
www.water-law.com

Oregon Water Resources Department
725 Summer Street NE, Suite A
Salem Oregon 97301-1266
(503) 986-0900
www.wrd.state.or.us

Application for Extension of Time for Municipal and Quasi-Municipal Water Use Permits

TO THE DIRECTOR OF THE OREGON WATER RESOURCES DEPARTMENT

A separate extension application must be submitted for <u>each</u> permit as per OAR 690-315-0070(2). This page, with an original signature by the permit holder of record, must accompany any application for extension of time.

This application and a summary of review criteria and procedures that are generally applicable to this application are available at http://www.wrd.state.or.us/OWRD/PUBS/forms.shtml

I, City of Banks — Mayor Teri Branstitre
NAME OF PERMIT HOLDER *[OAR 690-315-0070(1) and (3)(a)]* — NAME OF CONTACT

100 S. Main Street — Banks — Oregon — 97106
ADDRESS — CITY — STATE — ZIP

(503) 324-5112
PHONE — E-MAIL ADDRESS

the permit holder of: Application Number G - 8476

Permit Number G - 7593
[OAR 690-315-0070(3)(b)]

do hereby request that the time in which to:

☑ complete construction (of diversion/appropriation works and/or purchase and installation of the equipment necessary to the use of water), which time now expires on October 1, 1979, be extended to October 1, 2017,

and/or the time in which to:

☑ apply water to full beneficial use under the terms and conditions of the permit, which time now expires on October 1, 1980, be extended to October 1, 2017.

I am the permittee, or have written authorization from the permittee, to apply for an extension of time under this permit. I certify that the information I have provided in this application is true and correct to the best of my knowledge.

T. Branstitre — 5/8/07
Signature — Date

Last Revised: 01/19/2007 — WRAD

RECEIVED
MAY 17 2007
WATER RESOURCES DEPT
SALEM, OREGON

1. **The appropriate fee, as specified under ORS 536.050.**

   Please find enclosed a check made payable to the Oregon Department of Water Resources for $250, as required by ORS 536.050 to accompany the Application for Extension of Time For Quasi-Municipal and Municipal Water Use Permits.

2. **For Quasi-Municipal water use permits, evidence of the actions taken to begin actual construction on the project, if required under the applicable statute.**

   This item does not apply to the City of Banks.

3. **For Municipal water use permits issued on or after June 29, 2005, evidence of actions taken to begin actual construction on the project.**

   This item does not apply to the City of Banks. The Department issued Permit G-7593 on December 2, 1977. (*Exhibit A*).

4. **Evidence of actions taken to develop the water right permit within the permitted time period and/or time period of the previous extension.**

   As the tables below demonstrate, the City of Banks has expended considerable time and resources developing its water system and employing technical experts to assist in the same. In particular, the City applied for and was granted Permit G-7593 to appropriate water from a well (the "Behrman Well") for municipal use within the City of Banks' service area. The charts below demonstrate the actions and work taken by the City to develop Permit G-7593.

   For reference the following abbreviations are used in the table below:
   WMCP = Water Management and Conservation Plan (*Exhibit B*)
   WSMP = 1995 Water System Master Plan (*Exhibit C*).
   WSMP Update = 1998 Water System Master Plan Update (*Exhibit D*).

not available for review 7-2007

Dates	All Work and Actions Accomplished Before Permit was Issued	Cost
8/16/1977	A.M. Jannsen Drilling Co. began drilling the Behrman Well.	Unavailable
8/24/1977	A.M. Jannsen Drilling Co. completed drilling Behrman Well. (*Exhibit E*).	Unavailable
9/29/1977	City of Banks filed Application No. G-8476 for a Permit to Appropriate Ground Water.	$35.00

Dates	All Work and Actions Accomplished During Permitted Time Period	Cost
12/2/1977	The permit was signed.	NA
12/2/1978	The permit specified "Actual Construction Work" shall begin "(A-Date") on or before 12/2/1978.	NA

1979	City of Banks completed development of Behrman Well, including construction of well house and piping assembly. (WMCP 3-5)	$48,000.00 (estimated)
10/1/1979	The permit specified that actual construction work shall be completed on or before 10/1/1979.	NA
10/1/1980	The permit specified complete applications of water to the use shall be made ("C-Date") by 10/1/1980.	NA
12/4/1980	City of Banks filed Form C indicating: "Water was used beginning June 13th, 1980 to furnish water for the State of Oregon for ash removal – Online and operating fully October 1st, 1980." (*Exhibit F*).	NA
12/11/1980	City of Banks filed Form B indicating that completion of construction occurred by October 30th, 1979. Exhibit F	NA

Dates	**All Work and Actions Accomplished After Permit "C-Date" and Prior to Any Extension of Time Request**	**Cost**
1983	"Engineering Investigation of the Banks Water System and a Master Plan for Future Development" prepared for the City of Banks by Klein Consulting Engineers. (WMCP 1-2) referenced report	Unavailable
1994	Completed construction of Carsten Reservoir Tank No. 1 (500,000 gallons). (WMCP Table 3-2).	$342,000.00
4/15/1994	"Preliminary Engineering Report for a Slow Sand Filter Water Treatment Plant" prepared for the City of Banks by Robert E. Meyer Consultants, Inc. (WSMP, 13) report not provided	Unavailable
12/1/1994	"Hydrogeologic Investigation, Water Resources Development" prepared for the City of Banks by Squier Associates to evaluate the ground water resources in the area surrounding the City of Banks. (WSMP Appendix B)	Unavailable
2/1995	City of Banks Water System Master Plan prepared by Robert E. Meyer Consultants, Inc. not provided	Unavailable
1997	City constructed 12-inch water main loop and 8,000 lineal feet of 8-inch distribution piping to serve customers in new developments. (WMCP 3-7).	$190,000.00 to $300,000.00 (estimated)
9/1998	City of Banks Water System Master Plan Update prepared by Bookman-Edmonston Engineering, Inc.	Unavailable
1999	Completed construction of Carsten Reservoir Tank No. 2. (1,000,000 gallons) (WMCP Table 3-2). pg 3-7	$343,000.00 (projected cost)
2000	City of Banks added new telemetry and meters to monitor the production rate of the Behrman Well. (WMCP 3-5).	$25,000
1/2001	Water Management and Conservation Plan prepared for the City of Banks by LDC Design Group, Inc.	$70,000 (estimated)
2001	Purchase Kelly Field.	$415,000.00
1996-2001	Replaced well pump. (WMCP 3-5).	Unavailable
2002	Install new line from Well to Reservoir.	$19,000.00
3/22/2005	City began drilling Well #2.	$113,400.00
5/25/2005	City completed drilling Well #2. (*Exhibit G*).	Combined with

		above
12/28/2005	City filed Permit Amendment Application T-10055 to add Well #2 as an additional point of appropriation under Permit G-7593.	$350.00
2006	City implemented new water billing system	$11,000.00

5. **Evidence of compliance with conditions contained in the original permit and any previous extension(s). If any of the conditions have not been satisfied, please explain the reason(s) why.**

The only specific condition contained in Permit G-7593 (attached as Exhibit A) required the City to "install and maintain a weir, meter, or other suitable measuring device, and shall keep a complete record of the amount of ground water withdrawn."

1. The City installed appropriate metering devices to record the amount of ground water withdrawn.
2. The City has consistently compiled a record of the amount of ground water withdrawn from the Behrman Well, and has submitted water use reports to the Department for this permitted withdrawal since at least 1988. (See City of Banks water use reports on OWRD website) http://apps2.wrd.state.or.us/apps/wr/wateruse_report/

1988-2004 available

6. **Evidence of the maximum rate of water diverted to date for beneficial use under the permit and/or prior extensions of time, if any, made to date.**

Maximum instantaneous rate = 0.613 cfs (cubic feet per second).

By letter dated July 14, 1993, in conjunction with the City's Final Proof Survey, and included within the Permit file, R.W. Klassen indicted that the maximum use reached 275 gpm (0.613 cfs). That is the largest recorded water use present in the water right file.

7. **An estimate of the population served under this permit and a description of the methodology(ies) used to make this estimate.**

The City of Banks primarily serves the population within the City's boundaries, but also serves water service customers living outside the City. Currently, the City estimates that 1,876 people are served under Permit G7593. This figure comprises the approximate current population within the City of Banks' principal service area (defined as the city limits of the City of Banks) of 1,435 as of July 1, 2006, and the current estimate of 441 people served outside City limits (calculated at 98 homes served outside City limits with an average of 4.5 persons per household, 98 * 4.5 = 441)

The City's current population estimates are derived from Portland State University Population Research Center's estimates, and were presented in Table 4 of the 2006 Oregon Population Report, attached as *Exhibit I* and available at http://www.pdx.edu/prc. The PRC's

methodology for its population estimates is explained in detail on page 4 of the 2006 Report. (*Exhibit J*).

8. **A description of the financial expenditures made toward completion of the water development under Permit G-7593.**

The City has been unable to locate some records related to financial expenditures made toward completion of the water development under Permit G-7593. To the extent available, expenditures are included in the Table accompanying Item #4. In some cases, expenditures were estimated according to the proposed or estimated cost, as contained in the City's WMCP, WSMP, WSMP update, or other City records.

Based on the located records, the City has expended more than $1,686,785 on projects and work related to its water system since 1977, and at least $205,435 on projects related directly to development of Permit G-7593. These totals do not include the cost of drilling the Behrman Well, nor do they include expenditures that could not be confirmed by the City because of missing records.

It is clear that since 1977, the City of Banks has invested substantial sums of money in developing its water system, including those parts of the system specific to the Behrman Well. Cost estimates and figures for each specific activity related to development of Permit G-7593 are located in response to Item #4 above.

9. **An estimate of the cost necessary to complete the water development.**

The intent of this extension application is to extend the development time of Permit G-7593 so that the City can obtain the Department's approval of the City's Permit Amendment Application T-10055. If granted, Permit Amendment T-10055 would allow the City to use Well #2, or a combination of Well #2 and the Behrman Well to pump ground water up to the permitted amount of 0.67 cfs, and thus fully develop Permit G-7593. Assuming that Permit Amendment Application T-10055 is approved, the City of Banks estimates that an additional $200,000 is necessary to place Well #2 online and complete water development.

This figure includes estimated legal, consulting, and administrative fees, as well as the cost of connecting the well to the current water system. Once the City's extension application and permit amendment are approved, the City will put the project out to bid and obtain a set figure for completing the necessary connection of Well #2 to the current water system.

10. **A summary of any events that delayed completion of the water development or application of water to full beneficial use, including other governmental requirements, if any, relating to the project that have significantly delayed completion of construction or perfection of the right.**

There are many events that delayed completion of the water development or application of water to full beneficial use under Permit G-7593. In general, the Behrman Well performed below its original specifications, and thus the yield was less than expected. Accordingly, the City has been limited at times of peak demand to a withdrawal of 0.613 cfs from the

Behrman Well. Due to a number of reasons, including governmental requirements, technical difficulties, economic and financial issues, rapid growth, and severe weather, the City lacked the necessary resources to fully develop the remainder of Permit G7593 until recently.

Technical difficulties: As noted, the City of Banks was unable to put 0.67 cfs of water to full beneficial use by the C-Date because the well performed below specifications. On August 25, 1977, the Behrman Well was test pumped for a 48 hour period, and the ensuing report by Klein Consulting Engineers indicated that the well could be pumped at a sustained rate of 300 gpm. However, the actual sustained pumping rate is somewhat less, and the City's only realistic and reasonable option to fully develop Permit G-7593 involved drilling an additional well. However, the City lacked the resources to do so, and for many years, the City could get by with the use of other sources to make up the difference at times of peak demand. However, a relatively recent explosion in growth has pushed the City's water system to capacity, and the City must fully utilize its current water permits and water rights to meet current and projected future demands.

Actual growth rates/peak demand: In general, the Behrman Well was developed to supplement the City's capacity during peak summer months. As a result, the Well is operated during the summer months to allow the City's water system to meet peak seasonal demands. (WMCP 2-3). However, recent rapid growth in the City has forced the City to rely more heavily on the Behrman Well and often the City is forced to exceed the recommended maximum daily running time of 18 hours per day to meet peak demands. (WMCP 2-4).

Economic Reasons: The City of Banks is a small municipality that operates on a tight budget. As the City's water system has aged, the City has expended significant financial resources maintaining and updating the current system, and investigating the most efficient and cost-effective methods of increasing the reliability of its water system. Accordingly, much of the work that was deemed necessary to ensure reliability of the current water system took precedence over developing the remainder of Permit G-7593. Such repairs and improvements have helped the City reduce leakage within the system, ensured the quality of the drinking water, and improved conservation methods within the City. The table accompanying Item #4 provides ample evidence of the public works investment the City has made in recent years to improve its water system. In addition, the City has expended significant funds on legal and consulting fees for activities associated with its water system development, including acquiring necessary easements and related litigation.

Severe Weather: In February 1996, severe flooding and an accompanying mudslide irreparably damaged the City's intake structure at the Large Spring (Certificate 5353), requiring the City to spend over $189,000 building a replacement.

Government requirements: The City was also required to build a sand filtration plant in response to the Federal Surface Water Treatment Rule, enacted in 1986. Accordingly, the City commissioned an appropriate study and built a slow-sand filtration plant, which was completed in 1997 at a cost exceeding $635,000.

Additional events: Increased logging activity on private land within the City's watershed put the City's water supply at risk of contamination. Accordingly, to protect the watershed the City purchased "Kelly Field" in 2001 at a cost of $415,000, and replanted the property with trees at a cost of approximately $21,000.

In recent years, the City has hired multiple consultants to examine the water system and evaluate options for expanding capacity of the system, especially during times of peak demand. The City's WMCP and Water System Master Plan both recommended maximizing existing sources of supply, while at the same time evaluating additional sources. Because all other sources are fully developed, the City desires to extend Permit G-7593 and develop the remainder of the permitted amount that has not been put to beneficial use.

11. An estimated demand projection and a description of the methodology(ies) used for the subject water right permit, considering the other water rights and contracts held by the municipal or quasi-municipal water use permit holder, and a date by which the water development is anticipated to be completed and water put to full beneficial use.

a. Inventory of Water Rights Held
An inventory of water rights held is attached as *Exhibit K*.

b. Water Supply Contracts and/or Agreements
The City of Banks does not currently have any water supply contracts or agreements with any other entities.

c. Current Peak Water Demands
The total rate of water being used to meet current peak demands for water from all water rights held by the City of Banks is 0.33 million gallons per day.

d. Projected Population and Future Peak Water Demands
The projected population growth rate and associated future peak water demands, are as follows:
- The City has adopted a population forecast of 3,739 persons by the year 2024.
- The City has yet to develop a peak water demand based on the official population forecast. The City is currently without a City Engineer, and anticipates that the new City Engineer will determine a future peak water demand. The City will supplement this application with that information when it is determined.

e. Potential Growth
In the foreseeable future, the City's service area could potentially expand to surrounding areas and future housing developments. These projects will require additional water demands, and the City is currently exploring additional sources of water to meet future demand. However, Permit G-7593 is necessary to meet current peak demands.

f. Anticipated Water Development Completion Date
The City anticipates that water development for Permit G7593 will occur within the next 1 to 2 years. However, this estimate is contingent upon approval of this extension

application and Permit Amendment T-10055, as well as having the financial resources necessary to put Well #2 online.

12. **A summary of the plan and schedule to complete construction and/or perfect the water right.**

As noted above, the City is currently in need of the extra capacity that will become available if this extension application is granted, and the Department approves Permit Amendment Application T-10055. Once the City's applications are approved and the City can permissibly use Well #2, the City anticipates that the Well can be put online within several months, after the City completes the public bidding process and secures a contractor to do so.

From a technical standpoint, to "complete construction" of Well # 2 the City must submit the project to the public bidding process and secure a contractor to perform the necessary tasks to complete the interconnection of the Behrman Well and Well #2, as well as the necessary connection to the current storage and distribution system.

13. **Justification for the time requested to complete the project and/or apply the water to full beneficial use.**

The City has already expended considerable effort and money to develop Well #2, which will allow the City to fully develop Permit G-7593 within a short time period. Although the City has requested 10 years to apply the water to full beneficial use, the City anticipates that application to beneficial use will occur much more quickly. Nevertheless, the City requests until 2017 to account for any unforeseen circumstances that may prevent the City from using the new well and further developing Permit G-7593. Of course, the City cannot put Well #2 online until its Permit Amendment Application T-10055 is approved by the Department. A recent letter to the City indicated that the processing time for extension applications could take several years, due to a backlog of requests. Accordingly, the time requested takes into account the potential delay due to the current backlog.

14. **Any other information you wish the Department to consider while evaluating the extension of time application.**

The City requests approval of the extension of time application to allow it to move forward with Permit Amendment T-10055 and bring Well #2 online. The addition of a second well will provide the City with the ability to fully perfect Permit G-7593, while improving the City's ability to meet peak demands, and the operating reliability of the Behrman Well. Currently, the City is forced to operate the Behrman Well above recommended operating times, which places the water supply at risk and could reduce well yield. This extension application is an important part of the City's attempts to secure a safe and sufficient water supply for its citizens.

Permit G-7593

Water Year	Unit	Oct	Nov	Dec	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep
2004	G	1672500	653300	771100	518200	582000	744000	246600	1503500	3598900	7318800	5308300	2882500
2003	G	3125600	1624300	1894500	1473500	286500	114400	848000	171000	4115700	7180600	5760400	5443200
2002	G	4590600	2138100	1350600	0	0	0	0	379800	3342200	5133600	6787000	4811200
2001	G	4378600	4867400	1832500	1160200	3243200	1916400	2119400	3780200	5126000	6734500	6894700	5617100
1998	C	0	0	0	0	0	0	0	0	355200	6702100	10176862	7040452
1997	C	0	0	0	0	0	0	0	34288	32243	435718	509330	92407
1996	C	337916	377944	361727	344026	634919	383685	362516	339388	430033	747774	734794	483335
1994	C	311307	212747	206693	331333	290453	208293	173400	265453	195453	623866	397267	303480
1993	C	305040	206707	321360	327067	173733	30197	139667	160453	154787	170853	357497	345965
1992	C	159933	162893	220547	98107	190707	78947	112253	219227	332893	414120	354574	181520
1991	C	184040	131066	196947	136733	100493	88080	76107	96293	102160	351960	415773	222093
1990	C	54750	336020	211860	210670	49750	166270	55720	65520	127650	281300	316480	243090
1988	G	0	0	0	3150000	3150000	3150000	3150000	3150000	3150000	3150000	3150000	3150000

Water Rights Information Query Results

	Contacts	Application	Permit	Certificate	Claim	Decree	Transfers	Status
Select	CITY OF BANKS CITY HALL 150 NE BANKS RD BANKS, OR 97106	G8476	G7593				T10055 (Changes this right)	NC
Select	CITY OF BANKS CITY HALL 150 NE BANKS RD BANKS, OR 97106	S9207	S6516	5353				NC
Select	CITY OF BANKS ROBERT ORLOWSKI 100 S MAIN ST BANKS, OR 97106	G15887						NC
Select	CITY OF BANKS 150 NE BANKS RD BANKS, OR 97106	S65611	S48173	83138				NC

Help understanding and working with the Water Rights Information System

Download: Point of diversion data, Place of use data, Stakeholder data

Return to WRIS Query

WATER RESOURCES DEPARTMENT
REIMBURSEMENT AUTHORITY ESTIMATE APPLICATION

House Bill 2551 (2003 Oregon Laws) authorizes the Oregon Water Resources Department to expedite or enhance regulatory processes voluntarily requested under the agreement. The voluntary agreement can be entered into with any person requesting services and agreeing to pay the Department's costs of providing the service.

The Department has established a pool of qualified contractors to perform expedited services for water right transfers, water right permits extensions, and water right certificates.

The purpose of this application is to obtain an estimate from the next qualified contractor in the appropriate pool. There is a non-refundable application fee of $125.00 per request. The contractor will provide an estimate of the cost and of the time required to process and develop a recommendation on the request of a: *(check one)*:

REQUEST	TYPE	FILE NUMBER
☐	Transfer Application	
☐	Certificate Request	
☒	Extension of Time Request	67593

	Applicant Information	Applicant's Representative/Contact
Name: (Please Print)	City of Banks	Jolynn Becker
Address:	100 S Main St	"
	Banks OR 97106	"
Phone:	503-324-5112	"
Fax	503-324-6674	"
E-Mail Address:		recorder@cityofbanksoreg

I understand the following:

- There is a non-refundable application fee of $125.00 per request.
- That upon receipt of my non-refundable application fee in the amount of $ 125.00, OWRD will assign my request to the next contractor in the pool of contractors performing expedited services.
- That this fee covers the copying, the mailing cost, as well as the cost for the contractor to evaluate and provide the estimate for processing of the request.
- That OWRD will provide all pertinent information to the assigned contractor within three (3) business days.
- That OWRD will, within fourteen (14) days, notify me in writing of the estimates of costs and time frame for the expedited service.
- That upon receiving the estimates I may agree or decline to enter into a formal contract to pay the estimated cost in advance to initiate the expedited service.
- An incomplete or inaccurate application may delay the process and increase the cost to process my request.
- Expedited processing does not guarantee a favorable review of my request.
- Send completed Application and payment to: **OWRD – Reimbursement Authority Program**
  725 Summer St. NE, Suite A
  Salem, OR 97301-1266.

I certify that I am the *(check one)* ☐ Applicant ☒ Applicant's Representative ☐ Other *(Please specify)*_____

Signature: Teri Branstitre Name: Teri Branstitre

OWRD USE ONLY

Contractor Assigned: Newton	Total Amount Paid: $ 125
OWRD Approval:	

Revised 6/21/2004

RECEIVED
MAY 17 2007
WATER RESOURCES DEPT
SALEM, OREGON

STATE OF OREGON

WATER RESOURCES DEPARTMENT

RECEIPT # 87626

725 Summer St. N.E. Ste. A
SALEM, OR 97301-4172
(503) 986-0900 / (503) 986-0904 (fax)

INVOICE # _____

RECEIVED FROM: Schroeder Law Offices PC

BY: _____

APPLICATION	G-8476
PERMIT	G-7593
TRANSFER	

CASH: ☐ CHECK:# ☒ 15315 OTHER: (IDENTIFY) ☐ _____

TOTAL REC'D $ 250.00

1083 TREASURY 4170 WRD MISC CASH ACCT

0407	COPIES		$
_____	OTHER:	(IDENTIFY) _____	$

0243 I/S Lease _____ 0244 Muni Water Mgmt. Plan _____ 0245 Cons. Water _____

4270 WRD OPERATING ACCT

MISCELLANEOUS PCA-41611

0407	COPY & TAPE FEES		$
0410	RESEARCH FEES		$
0408	MISC REVENUE: (IDENTIFY)	_____	$
TC162	DEPOSIT LIAB. (IDENTIFY)	_____	$
0240	EXTENSION OF TIME		$ 250.00

		EXAM FEE		RECORD FEE
	WATER RIGHTS:			
0201	SURFACE WATER	$	0202	$
0203	GROUND WATER	$	0204	$
0205	TRANSFER	$		

		EXAM FEE		LICENSE FEE
	WELL CONSTRUCTION			
0218	WELL DRILL CONSTRUCTOR	$	0219	$
	LANDOWNER'S PERMIT		0220	$

_____ OTHER (IDENTIFY) _____

0536 TREASURY 0437 WELL CONST. START FEE

0211	WELL CONST START FEE	$	CARD #	
0210	MONITORING WELLS	$	CARD #	

_____ OTHER (IDENTIFY) _____

0607 TREASURY 0467 HYDRO ACTIVITY

		LIC NUMBER	
0233	POWER LICENSE FEE (FW/WRD)		$
0231	HYDRO LICENSE FEE (FW/WRD)		$
_____	HYDRO APPLICATION		$

____ TREASURY OTHER / RDX

FUND _____ TITLE _____

OBJ. CODE _____ VENDOR # _____

DESCRIPTION _____ $

RECEIPT: 87626 DATED: 5/17/07 BY: _____

Distribution – White Copy - Customer, Yellow Copy - Fiscal, Blue Copy - File, Buff Copy - Fiscal

SCHROEDER LAW OFFICES, P.C.

58.00 Oregon Water Resources Department Salem			
05/09/07 Application for time extension App G-8476, Permit G-7593		250.00	250.00

RECEIVED

MAY 17 2007

WATER RESOURCES DEPT
SALEM, OREGON

05/09/07 15315 Gross: 250.00 Ded: 0.00 Net: 250.00

T-10055

Contact Information

Current contact information

AGENT:
LDC DESIGN GROUP
THOMAS MICHALEK
20085 NW TANASBOURNE DR
HILLSBORO, OR 97124

APPLICANT:
CITY OF BANKS
100 S MAIN ST
BANKS, OR 97106

Transfer Information

View all scanned documents

Status

- Type: Permit Amendment
- Status: Under Review

Proposed Action

- Additional Point of Appropriation

Comments

- Cannot process Permit Amendment because B & C Dates have expired. Ap needs to submit a permit extension of time application and receive approv we can process permit amendment. File has been placed in the "Awaiting Extension"

Processing History

Staff Person Responsible: LISA JARAMILLO

Process Step	Date Initiated	Estimated Completion Date	Date Completed	Rema
Received	12/28/2005		12/28/2005	
Transfer Initial Public Notice	1/3/2006		1/3/2006	
File Assigned	1/18/2006			
Watermaster Review	1/18/2006		1/24/2006	
Groundwater Review	1/18/2006			
File Assigned	10/25/2006			
Deficiency Letter	3/26/2007	4/25/2007		

Rights this impacts

	Application	Permit	Certificate	Decree	Clai
Permit:G 7593 *	G8476	G7593			

Results of the transfer

n/a

Help understanding and working with the Water Rights Information System

Report Errors with Water Right Data

Return to WRIS Query

Application # G-8476 **Permit #** G-7593

Public Notice Route Slip ... New Application Extension of Time

per Division 315 Rules... (Extensions received on July 1, 2001 or after)

- **WRIG...**
  Money Receipted on: 5/17/07
- **Ann Reece...**
  - ☑ Extension Application is Complete
    (If NOT complete, send certified letter requesting add'l information.)
  - ☑ Added to tracking spreadsheet

If Extension Appl complete and $250 fee submitted, route to...

- **Jonnine Skaug...**
  - ☒ Publish on Public Notice (initial 30-day comment): Date of notice 5/22/07 JS
    Update "cdatewext.DB" Database:
  - ☒ In the "PNotice Date" field... Enter the date the Extension Application was published on the Public Notice.
  - ☒ In the "Ext Filed" field... Enter the date the Extension Application was received.

Water Rights Information Query Results

	Contacts	Application	Permit	Certificate	Claim	Decree	Transfers	Status
Select	▷ CITY OF BANKS CITY HALL 150 NE BANKS RD BANKS, OR 97106	G8476	G7593				▷ T10055 (Changes this right)	NC
Select	▷ CITY OF BANKS CITY HALL 150 NE BANKS RD BANKS, OR 97106	S9207	SPRING, TRIB TO DAIRY CREEK S6516	5353			.42CFS	NC
Select	▷ CITY OF BANKS ROBERT ORLOWSKI 100 S MAIN ST BANKS, OR 97106	G15887						NC
Select	▷ CITY OF BANKS 150 NE BANKS RD BANKS, OR 97106	2 UNNAMED STREAMS S65611	S48173	83138			.180CFS	NC

Help understanding and working with the Water Rights Information System

Download: Point of diversion data, Place of use data, Stakeholder data

Return to WRIS Query

Application # G-8476 Permit # G-7593

Name of Permit Holder: City of Banks

Reimbursement Authority Process
Itemized Estimate Sheet
for
Permit Extension of Time Applications

(Indicate the estimated amount of time, in ½ hour increments, needed to complete each item listed below.)

	Item	Estimated Time
1	Completion of the Extension of Time Application Completeness Checklist	2.5
2	Completion of the Extension of Time Proposed Final Order Checklist (*Regular Ext: approx 2 hrs. to 6 hrs. // Muni/Quasi-Muni Ext: approx 4 hrs. to 24 hrs.)	4.0
3	Preparation of the Extension of Time Proposed Final Order document (*Regular Ext: approx 2 hrs. to 5 hrs. // Muni/Quasi-Muni Ext: approx 4 hrs. to 12 hrs.)	6.0
4	Preparation of the Extension of Time Final Order document	3.0
	Total Estimated Time:	15.5

***NOTE:** **Items #2 and #3 will take a greater amount of time for Municipal and Quasi-Municipal water use permits.**

Estimated calendar days needed to complete work once a Work Order has been Executed 14
(Typical turn around should not exceed Ten (10) business days.)

Name of Contractor: Newton Consulting Inc **Date:** 6/15/2007

Instructions for completing the Reimbursement Authority Process Itemized Estimate Sheet:

To determine the estimated amount of time required to perform the project:
Review the Permit;
Review the Extension of Time Application; and
Review the file record.

Revised 4/9/04

REIMBURSEMENT AUTHORITY

Permit Extension Ground Water Review

Date: May 22, 2007

To: Doug Woodcock, Ground Water Section Manager

From: Kim French, Permit Extension Review

Subject: Ground Water Review for File G- 8476 / Permit G- 7593

(Date permit issued: 12/1/1977)

The above referenced permit is currently being reviewed for an extension of time. Before I can determine whether or not an extension of time should be granted, a Ground Water review for this file is necessary. Special designations affecting this permit are as follows:

NOTE: *Original Division 9 review completed by:* none

☐ Located within a Ground Water Administrative Area (Critical, Limited, etc.)

☐ 5-Year Limited Permit

☐ Other:

☑ None (no special designations)

Donna Miller 6/5/07

For Ground Water / Hydrology Staff Use:

Please answer the following questions. If necessary, attach an additional sheet.

1. Does the ground water source under this permit have the potential for substantial interference with surface water? No

   *[**NOTE:** Applies **ONLY** to **Municipal permits issued before November 2, 1998** - see OAR 690-315-0080(1) & (2)]*

2. Are there ground water supply concerns relevant to this extension of time that the Department should consider? NA

   *[**NOTE:** Does **NOT** apply to **Quasi- Municipal or Municipal permits issued before November 2, 1998** - see OAR 690-315-0080(5)]*

3. Should the Department establish a new reference level for water level declines due to the failure of permittee to submit annual measurements? NA

4. Should any additional conditions be added to this permit? No

5. Other issues or concerns? No

OREGON WATER RESOURCES DEPARTMENT
GROUND WATER REVIEW: MUNICIPAL PERMIT EXTENSION OF TIME

Date: June 4, 2007

To: Water Rights Section

From: Donn Miller, Staff Hydrogeologist

Extension Review for File # G- 8476 / **Permit # G-** 7593

****
The undeveloped portion of this permit has been evaluated under the Department's 690-09 rules and **Was** ☐ / **was not** ☒ found to have the Potential for Substantial Interference with surface water. The evaluation was conducted pursuant to OAR 690-315. Forward files found to have the potential for substantial interference to Oregon Department of Fish and Wildlife.

Undeveloped Portion of Permit in CFS: 0.057

Estimate of impact and location of evaluation (River mile or PLS)
Stream depletion occurs over a stream reach. Depletion can be variable due to the presence or absence of confining layers within the aquifer. The majority of the impact will extend over a reach twice the distance between the well and the stream.

Stream: _____ **Location** _____

Days of Pumping

30	60	90	120	150	180	210	240	270	300	330	360

Interference in CFS

Stream: _____ **Location** _____

Days of Pumping

30	60	90	120	150	180	210	240	270	300	330	360

Interference in CFS

Stream: _____ **Location** _____

Days of Pumping

30	60	90	120	150	180	210	240	270	300	330	360

Interference in CFS

Municipal/Quasi-Municipal Extension of Time Review

TO: Water Rights Section Date 6/4/07

FROM: Ground Water/Hydrology Section **Donn Miller**
Reviewer's Name

SUBJECT: File G- **8476** Supersedes review of **none**
Date of Review(s)

Criteria for Department Review of Extension Applications for Municipal and Quasi-Municipal Water Use Permits (Ground Water)

OAR 690-315-0080 (2)(c): *For ground water permits submitted to ODFW under this rule* (permits determined to have the potential for substantial interference), *the Department shall provide to ODFW and the applicant the Department's estimate of surface water impacts that would result from the use of the undeveloped portion of the ground water permit.* **This review is based upon available information and agency policies in place at the time of evaluation.**

A. GENERAL INFORMATION: Applicant's Name: **City of Banks** County: **Washington**

Applicant(s) seek(s) **0.057** cfs from **one** well(s) in the **Tualatin** Basin, **W Fork Dairy Creek** subbasin Quad Map: **Forest Grove**

Proposed use: **Municipal** Seasonality: **year round**

Well and aquifer data **(attach and number logs for existing wells; mark proposed wells as such under logid):**

Well	Logid	Applicant's Well #	Proposed Aquifer*	Proposed Rate(cfs)	Location (T/R-S QQ-Q)	Location, metes and bounds, e.g. 2250' N, 1200' E fr NW cor S 36
1	**WASH 7651**	**1**	**CRB**	**0.057**	**2N/3W-S31 NE-NW**	**150' S, 1990'E fr NW cor S 31**
2						
3						
4						
5						

* Alluvium, CRB, Bedrock

Well	Well Elev ft msl	First Water ft bls	SWL ft bls	SWL Date	Well Depth (ft)	Seal Interval (ft)	Casing Intervals (ft)	Liner Intervals (ft)	Perforations Or Screens (ft)	Well Yield (gpm)	Draw Down (ft)	Test Type
1	**229**	**130**	**34**	**8/24/77**	**450**	**0-210**	**0-210**	**none**	**none**	**275**	**224**	**P**

Use data from application for proposed wells.

Comments: At this location, the CRB is overlain by about 130 of clay and weathered baslt.

☐ **Well(s) #** _____, _____, _____, _____, _____, tap(s) an aquifer limited by an administrative restriction.
Name of administrative area: _____
Comments: **NA**

File 8476 continued Date 6/4/2007

GROUND WATER/SURFACE WATER CONSIDERATIONS, OAR 690-09-040

690-09-040 (1): Evaluation of aquifer confinement:

Well	Aquifer or Proposed Aquifer	Confined	Unconfined
1	**CRB**	☒	☐
		☐	☐
		☐	☐
		☐	☐
		☐	☐

Basis for aquifer confinement evaluation: Well Report, general nature of CRB

690-09-040 (2) (3): Evaluation of distance to, and hydraulic connection with, surface water sources. All wells located a horizontal distance less than ¼ mile from a surface water source that produce water from an unconfined aquifer shall be assumed to be hydraulically connected to the surface water source. Include in this table any streams located beyond one mile that are evaluated for PSI.

Well	SW #	Surface Water Name	GW Elev ft msl	SW Elev ft msl	Distance (ft)	Hydraulically Connected? YES	NO	ASSUMED	Potential for Subst. Interfer. Assumed? YES	NO
1	1	**Unnamed trib Dairy Creek**	195	229	130	☐	☒	☐	☐	☒
						☐	☐	☐	☐	☐
						☐	☐	☐	☐	☐
						☐	☐	☐	☐	☐
						☐	☐	☐	☐	☐
						☐	☐	☐	☐	☐
						☐	☐	☐	☐	☐
						☐	☐	☐	☐	☐
						☐	☐	☐	☐	☐

Basis for aquifer hydraulic connection evaluation: head relationships and geology

Water Availability Basin the well(s) are located within: W Fork Dairy Creek

690-09-040 (4): Evaluation of stream impacts for each well that has been determined or assumed to be **hydraulically connected and less than 1 mile** from a surface water source. Limit evaluation to instream rights and minimum stream flows that are pertinent to that surface water source, and not lower SW sources to which the stream under evaluation is tributary. Compare the requested rate against the 1% of 80% *natural* flow for the pertinent Water Availability Basin (WAB). If Q is not distributed by well, use full rate for each well. Any checked ☒ box indicates the well is assumed to have the potential to cause PSI.

Well	SW #	Well < ¼ mile?	Qw > 5 cfs?	Instream Water Right ID	Instream Water Right Q (cfs)	Qw > 1% ISWR?	80% Natural Flow (cfs)	Qw > 1% of 80% Natural Flow?	Interference @ 30 days (%)	Potential for Subst. Interfer. Assumed?
		☐	☐			☐		☐		☐
		☐	☐			☐		☐		☐
		☐	☐			☐		☐		☐
		☐	☐			☐		☐		☐
		☐	☐			☐		☐		☐
		☐	☐			☐		☐		☐
		☐	☐			☐		☐		☐
		☐	☐			☐		☐		☐

File 8476________________ continued Date 6/4/2007

690-09-040 (4): Evaluation of stream impacts by total appropriation for all wells determined or assumed to be **hydraulically connected and less than 1 mile** from a surface water source. **Complete only if Q is distributed among wells.** Otherwise same evaluation and limitations apply as in C3a above.

	SW #		Qw > 5 cfs?	Instream Water Right ID	Instream Water Right Q (cfs)	Qw > 1% ISWR?	80% Natural Flow (cfs)	Qw > 1% of 80% Natural Flow?	Interference @ 30 days (%)	Potential for Subst. Interfer. Assumed?
			☐			☐		☐		☐
			☐			☐		☐		☐
			☐			☐		☐		☐
			☐			☐		☐		☐

Comments: NA

690-09-040 (5): Estimated impacts on **hydraulically connected surface water sources greater than one mile** as a percentage of the proposed pumping rate. Limit evaluation to the effects that will occur up to one year after pumping begins. This table encompasses the considerations required by 09-040 (5)(a), (b), (c) and (d), which are not included on this form. Use additional sheets if calculated flows from more than one WAB are required.

Non-Distributed Wells													
Well	SW#	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
NA		%	%	%	%	%	%	%	%	%	%	%	%
Well Q as CFS													
Interference CFS													

Distributed Wells													
Well	SW#	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
		%	%	%	%	%	%	%	%	%	%	%	%
Well Q as CFS													
Interference CFS													
		%	%	%	%	%	%	%	%	%	%	%	%
Well Q as CFS													
Interference CFS													
		%	%	%	%	%	%	%	%	%	%	%	%
Well Q as CFS													
Interference CFS													
		%	%	%	%	%	%	%	%	%	%	%	%
Well Q as CFS													
Interference CFS													
		%	%	%	%	%	%	%	%	%	%	%	%
Well Q as CFS													
Interference CFS													
		%	%	%	%	%	%	%	%	%	%	%	%
Well Q as CFS													
Interference CFS													
Total Interf. CFS													

Comments: NA

File 8476 continued Date 6/4/2007

Extension Review Remarks / Conditions: The undeveloped portion of the permit is quite small. That piece is the subject of gw/sw review for extension. GW in the CRB is ultimately connected to surface water and discharges. That point of connect is likely miles away down gradient in the lower Tualatin Basin. The specifics of all that are a speculation. The GW section has largely adopted the view in these settings that there is no hydraulic connection with surface water for purposes of evaluation. Likewise, I am not proposing to quantify the surface water impacts. Suffice it to say that they would be below the various thresholds for the potential for substantial interference.

Attach estimates of surface water impacts to this review

References Used: topo map, USGS WSP 1697, file G-8476, well logs, pump test info

OREGON

Water Resources Department

Water Availability

WATER AVAILABILITY TABLE
Water Availability as of 6/ 5/2007 for
W FK DAIRY CR > DAIRY CR - AT MOUTH

Watershed ID #: 178 Basin: WILLAMETTE Exceedance Level: 80
Time: 09:44 Date: 06/05/2007

Select an Item Number for More Details

Item #	Watershed ID #	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Sto
1	181	YES	YES	YES	YES	YES	YES	YES	YES	YES	YES	YES	YES	YES
2	175	YES	YES	YES	YES	NO	NO	NO	NO	NO	NO	NO	YES	YES
3	30201006	YES	YES	YES	YES	NO	NO	NO	NO	NO	NO	NO	YES	YES
4	30201013	YES	YES	YES	YES	NO	NO	NO	NO	NO	NO	NO	YES	YES
5	30201002	YES	YES	YES	YES	NO	NO	NO	NO	NO	NO	NO	YES	YES
6	178	YES	YES	YES	YES	NO	NO	NO	NO	NO	NO	NO	YES	YES

STREAM NAMES
Water Availability as of 6/ 5/2007 for
W FK DAIRY CR > DAIRY CR - AT MOUTH

Watershed ID #: 178 Basin: WILLAMETTE Exceedance Level: 80
Time: 09:44 Date: 06/05/2007

Item	Watershed ID	Stream Name
1	181	WILLAMETTE R > COLUMBIA R - AT MOUTH
2	175	TUALATIN R > WILLAMETTE R - AT MOUTH
3	30201006	TUALATIN R > WILLAMETTE R - AT GAGE 14207500
4	30201013	TUALATIN R > WILLAMETTE R - AT GAGE 14206500
5	30201002	DAIRY CR > TUALATIN R - AT MOUTH
6	178	W FK DAIRY CR > DAIRY CR - AT MOUTH

LIMITING WATERSHEDS
Water Availability as of 6/ 5/2007 for
W FK DAIRY CR > DAIRY CR - AT MOUTH

Watershed ID #: 178 Basin: WILLAMETTE Exceedance Level: 80
Time: 09:44 Date: 06/05/2007

Mnth	Limiting Watershed	Stream Name	Water Avail?	Net Water Available
1	178	W FK DAIRY CR > DAIRY CR - AT MOUTH	YES	91.5
2	178	W FK DAIRY CR > DAIRY CR - AT MOUTH	YES	138.0
3	178	W FK DAIRY CR > DAIRY CR - AT MOUTH	YES	109.0
4	178	W FK DAIRY CR > DAIRY CR - AT MOUTH	YES	45.3
5	175	TUALATIN R > WILLAMETTE R - AT MOUTH	NO	-17.6
6	175	TUALATIN R > WILLAMETTE R - AT MOUTH	NO	-229.0
7	30201013	TUALATIN R > WILLAMETTE R - AT GAGE 14206500	NO	-347.0
8	30201013	TUALATIN R > WILLAMETTE R - AT GAGE 14206500	NO	-367.0
9	30201013	TUALATIN R > WILLAMETTE R - AT GAGE 14206500	NO	-307.0
10	30201013	TUALATIN R > WILLAMETTE R - AT GAGE 14206500	NO	-182.0
11	175	TUALATIN R > WILLAMETTE R - AT MOUTH	NO	-212.0
12	178	W FK DAIRY CR > DAIRY CR - AT MOUTH	YES	34.1
Stor	178	W FK DAIRY CR > DAIRY CR - AT MOUTH	YES	83200.0

DETAILED REPORT ON THE WATER AVAILABILITY CALCULATION
Water Availability as of 6/ 5/2007 for
WILLAMETTE R > COLUMBIA R - AT MOUTH

Watershed ID #: 181 Basin: WILLAMETTE Exceedance Level: 80
Time: 09:44 Date: 06/05/2007

Month	Natural	Consumptiv	Expected	Reserved	Instream	Net

	Stream Flow	Use and Storage	Stream Flow	Stream Flow	Require-ments	Water Available
1	27500.00	2500.00	25000.00	0.00	1500.00	23500.00
2	30000.00	7790.00	22200.00	0.00	1500.00	20700.00
3	28500.00	7410.00	21100.00	0.00	1500.00	19600.00
4	25400.00	7100.00	18300.00	0.00	1500.00	16800.00
5	20700.00	4400.00	16300.00	0.00	1500.00	14800.00
6	11000.00	2600.00	8400.00	0.00	1500.00	6900.00
7	6280.00	2550.00	3730.00	0.00	1500.00	2230.00
8	4890.00	2320.00	2570.00	0.00	1500.00	1070.00
9	4930.00	1940.00	2990.00	0.00	1500.00	1490.00
10	5990.00	741.00	5250.00	0.00	1500.00	3750.00
11	12700.00	963.00	11700.00	0.00	1500.00	10200.00
12	24800.00	1180.00	23600.00	0.00	1500.00	22100.00
Stor-50%	19700000	2486000	17300000	0	1090000	16200000

DETAILED REPORT OF CONSUMPTIVE USES AND STORAGES
Water Availability as of 6/ 5/2007 for
WILLAMETTE R > COLUMBIA R - AT MOUTH

Watershed ID #: 181 Basin: WILLAMETTE Exceedance Level: 80
Time: 09:44 Date: 06/05/2007

Mo	Storage	Irrig	Munic	Ind/Man	Commer	Domest	Agricul	Other	Total
1	1710.00	0.00	485.00	99.50	9.49	23.80	125.00	43.70	2500.00
2	7000.00	0.00	485.00	99.50	9.49	23.80	126.00	43.70	7790.00
3	6600.00	6.38	485.00	99.50	9.49	23.80	127.00	46.70	7400.00
4	6270.00	42.40	485.00	99.50	9.49	23.80	121.00	46.70	7100.00
5	3380.00	292.00	481.00	99.50	9.34	23.80	89.60	26.20	4400.00
6	442.00	584.00	1340.00	99.50	9.18	23.80	78.80	25.00	2600.00
7	14.00	992.00	1340.00	94.30	9.17	23.80	50.20	24.70	2550.00
8	2.03	779.00	1340.00	94.30	9.17	22.40	48.50	24.60	2320.00
9	0.75	385.00	1340.00	99.50	9.17	22.40	64.00	24.80	1950.00
10	0.53	27.60	476.00	99.50	9.18	22.40	67.10	38.70	741.00
11	198.00	0.00	485.00	99.50	9.48	23.80	106.00	42.20	964.00
12	390.00	0.00	485.00	99.50	9.49	23.80	126.00	43.70	1180.00

DETAILED REPORT OF RESERVATIONS FOR CONSUMPTIVE USE
Water Availability as of 6/ 5/2007 for
WILLAMETTE R > COLUMBIA R - AT MOUTH

Watershed ID #: 181 Basin: WILLAMETTE Exceedance Level: 80
Time: 09:44 Date: 06/05/2007

	Reservations							
APP #	0	0	0	0	0	0	0	TOTAL
Status / Use								
1	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
2	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
3	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
4	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
5	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
6	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
7	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
8	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
9	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
10	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
11	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
12	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00

DETAILED REPORT OF INSTREAM REQUIREMENTS
Water Availability as of 6/ 5/2007 for
WILLAMETTE R > COLUMBIA R - AT MOUTH

Watershed ID #: 181 Basin: WILLAMETTE Exceedance Level: 80
Time: 09:44 Date: 06/05/2007

	ISWRs						
APP # MF 181	0	0	0	0	0	0	MAXIMUM
Status Cert.							

1	1500.00	0.00	0.00	0.00	0.00	0.00	0.00	1500.00
2	1500.00	0.00	0.00	0.00	0.00	0.00	0.00	1500.00
3	1500.00	0.00	0.00	0.00	0.00	0.00	0.00	1500.00
4	1500.00	0.00	0.00	0.00	0.00	0.00	0.00	1500.00
5	1500.00	0.00	0.00	0.00	0.00	0.00	0.00	1500.00
6	1500.00	0.00	0.00	0.00	0.00	0.00	0.00	1500.00
7	1500.00	0.00	0.00	0.00	0.00	0.00	0.00	1500.00
8	1500.00	0.00	0.00	0.00	0.00	0.00	0.00	1500.00
9	1500.00	0.00	0.00	0.00	0.00	0.00	0.00	1500.00
10	1500.00	0.00	0.00	0.00	0.00	0.00	0.00	1500.00
11	1500.00	0.00	0.00	0.00	0.00	0.00	0.00	1500.00
12	1500.00	0.00	0.00	0.00	0.00	0.00	0.00	1500.00

DETAILED REPORT ON THE WATER AVAILABILITY CALCULATION
Water Availability as of 6/ 5/2007 for
TUALATIN R > WILLAMETTE R - AT MOUTH

Watershed ID #: 175 Basin: WILLAMETTE Exceedance Level: 80
Time: 09:44 Date: 06/05/2007

Month	Natural Stream Flow	Consumptiv Use and Storage	Expected Stream Flow	Reserved Stream Flow	Instream Require-ments	Net Water Available
1	1290.00	247.00	1040.00	0.00	250.00	793.00
2	1640.00	315.00	1330.00	0.00	250.00	1080.00
3	1300.00	211.00	1090.00	0.00	250.00	838.00
4	834.00	178.00	656.00	0.00	250.00	406.00
5	407.00	175.00	232.00	0.00	250.00	-17.60
6	191.00	289.00	-98.50	0.00	130.00	-229.00
7	90.30	332.00	-243.00	0.00	100.00	-343.00
8	68.60	312.00	-243.00	0.00	100.00	-343.00
9	46.80	254.00	-208.00	0.00	94.50	-302.00
10	52.00	97.80	-45.70	0.00	100.00	-146.00
11	183.00	146.00	37.50	0.00	250.00	-212.00
12	968.00	249.00	719.00	0.00	250.00	469.00
Stor-50%	913000	169200	778000	0	137000	671000

DETAILED REPORT OF CONSUMPTIVE USES AND STORAGES
Water Availability as of 6/ 5/2007 for
TUALATIN R > WILLAMETTE R - AT MOUTH

Watershed ID #: 175 Basin: WILLAMETTE Exceedance Level: 80
Time: 09:44 Date: 06/05/2007

Mo	Storage	Irrig	Munic	Ind/Man	Commer	Domest	Agricul	Other	Total
1	130.00	0.00	77.60	3.51	0.11	2.81	21.20	12.10	247.00
2	197.00	0.00	77.60	3.51	0.11	2.81	21.20	12.10	314.00
3	94.60	0.02	77.60	3.51	0.11	2.81	21.10	12.10	212.00
4	59.70	0.53	77.60	3.51	0.11	2.81	21.10	12.10	177.00
5	0.39	75.10	77.60	3.51	0.11	2.80	3.83	11.20	175.00
6	0.00	95.20	177.00	0.50	0.11	2.80	2.81	11.20	290.00
7	0.00	136.00	177.00	3.51	0.10	2.80	2.74	11.20	333.00
8	0.00	115.00	177.00	3.51	0.10	2.80	2.63	11.20	312.00
9	0.00	57.20	177.00	3.51	0.10	2.80	2.68	11.20	254.00
10	0.53	0.02	77.60	3.51	0.10	2.80	1.91	11.20	97.70
11	43.70	0.00	77.60	3.51	0.10	2.80	6.58	11.20	145.00
12	132.00	0.00	77.60	3.51	0.11	2.81	21.20	12.10	249.00

DETAILED REPORT OF RESERVATIONS FOR CONSUMPTIVE USE
Water Availability as of 6/ 5/2007 for
TUALATIN R > WILLAMETTE R - AT MOUTH

Watershed ID #: 175 Basin: WILLAMETTE Exceedance Level: 80
Time: 09:44 Date: 06/05/2007

	Reservations						
APP #	0	0	0	0	0	0	TOTAL
Status / Use							
1	0.00	0.00	0.00	0.00	0.00	0.00	0.00
2	0.00	0.00	0.00	0.00	0.00	0.00	0.00
3	0.00	0.00	0.00	0.00	0.00	0.00	0.00

4	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
5	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
6	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
7	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
8	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
9	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
10	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
11	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
12	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00

DETAILED REPORT OF INSTREAM REQUIREMENTS
Water Availability as of 6/ 5/2007 for
TUALATIN R > WILLAMETTE R - AT MOUTH

Watershed ID #: 175 Basin: WILLAMETTE Exceedance Level: 80
Time: 09:44 Date: 06/05/2007

	ISWRs						
APP #	IS 73538	MF 173	MF 174	MF 175	0	0	0	MAXIMUM
Status	Cert.	Cert.	App.	App.				
1	100.00	30.00	30.00	250.00	0.00	0.00	0.00	250.00
2	100.00	30.00	30.00	250.00	0.00	0.00	0.00	250.00
3	100.00	30.00	30.00	250.00	0.00	0.00	0.00	250.00
4	100.00	30.00	30.00	250.00	0.00	0.00	0.00	250.00
5	100.00	30.00	30.00	250.00	0.00	0.00	0.00	250.00
6	100.00	20.00	20.00	130.00	0.00	0.00	0.00	130.00
7	100.00	20.00	20.00	40.00	0.00	0.00	0.00	100.00
8	100.00	15.00	15.00	30.00	0.00	0.00	0.00	100.00
9	94.50	15.00	15.00	25.00	0.00	0.00	0.00	94.50
10	100.00	30.00	30.00	90.00	0.00	0.00	0.00	100.00
11	100.00	30.00	30.00	250.00	0.00	0.00	0.00	250.00
12	100.00	30.00	30.00	250.00	0.00	0.00	0.00	250.00

DETAILED REPORT ON THE WATER AVAILABILITY CALCULATION
Water Availability as of 6/ 5/2007 for
TUALATIN R > WILLAMETTE R - AT GAGE 14207500

Watershed ID #: 30201006 Basin: WILLAMETTE Exceedance Level: 80
Time: 09:44 Date: 06/05/2007

Month	Natural Stream Flow	Consumptiv Use and Storage	Expected Stream Flow	Reserved Stream Flow	Instream Require-ments	Net Water Available
1	1290.00	246.00	1040.00	0.00	250.00	794.00
2	1640.00	314.00	1330.00	0.00	250.00	1080.00
3	1300.00	210.00	1090.00	0.00	250.00	839.00
4	833.00	177.00	657.00	0.00	250.00	407.00
5	407.00	173.00	234.00	0.00	250.00	-16.30
6	191.00	289.00	-98.10	0.00	130.00	-228.00
7	90.30	331.00	-241.00	0.00	100.00	-341.00
8	68.60	311.00	-242.00	0.00	100.00	-342.00
9	46.80	253.00	-206.00	0.00	94.50	-301.00
10	52.00	96.80	-44.80	0.00	100.00	-145.00
11	183.00	145.00	38.50	0.00	250.00	-212.00
12	967.00	248.00	719.00	0.00	250.00	469.00
Stor-50%	913000	168300	778000	0	137000	672000

DETAILED REPORT OF CONSUMPTIVE USES AND STORAGES
Water Availability as of 6/ 5/2007 for
TUALATIN R > WILLAMETTE R - AT GAGE 14207500

Watershed ID #: 30201006 Basin: WILLAMETTE Exceedance Level: 80
Time: 09:44 Date: 06/05/2007

Mo	Storage	Irrig	Munic	Ind/Man	Commer	Domest	Agricul	Other	Total
1	129.00	0.00	77.60	2.59	0.11	2.65	21.30	12.10	245.00
2	197.00	0.00	77.60	2.59	0.11	2.65	21.30	12.10	313.00
3	94.30	0.02	77.60	2.59	0.11	2.65	21.30	12.10	211.00
4	59.60	0.53	77.60	2.59	0.11	2.65	21.30	12.10	176.00
5	0.38	74.70	77.60	2.59	0.11	2.64	4.00	11.20	173.00
6	0.00	94.70	177.00	0.50	0.11	2.64	2.98	11.20	289.00
7	0.00	135.00	177.00	2.59	0.10	2.64	2.90	11.20	331.00

8	0.00	114.00	177.00	2.59	0.10	2.64	2.79	11.20	310.00
9	0.00	57.00	177.00	2.59	0.10	2.64	2.84	11.20	253.00
10	0.52	0.02	77.60	2.59	0.10	2.64	2.08	11.20	96.80
11	43.60	0.00	77.60	2.59	0.10	2.64	6.74	11.20	144.00
12	131.00	0.00	77.60	2.59	0.11	2.65	21.30	12.10	247.00

DETAILED REPORT OF RESERVATIONS FOR CONSUMPTIVE USE
Water Availability as of 6/ 5/2007 for
TUALATIN R > WILLAMETTE R - AT GAGE 14207500

Watershed ID #: 30201006 Basin: WILLAMETTE Exceedance Level: 80
Time: 09:44 Date: 06/05/2007

	Reservations							
APP #	0	0	0	0	0	0	0	TOTAL
Status / Use								
1	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
2	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
3	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
4	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
5	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
6	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
7	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
8	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
9	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
10	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
11	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
12	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00

DETAILED REPORT OF INSTREAM REQUIREMENTS
Water Availability as of 6/ 5/2007 for
TUALATIN R > WILLAMETTE R - AT GAGE 14207500

Watershed ID #: 30201006 Basin: WILLAMETTE Exceedance Level: 80
Time: 09:44 Date: 06/05/2007

	ISWRs						
APP #	IS 73538	MF 173	MF 174	MF 175	0	0	0	MAXIMUM
Status	Cert.	Cert.	App.	App.				
1	100.00	30.00	30.00	250.00	0.00	0.00	0.00	250.00
2	100.00	30.00	30.00	250.00	0.00	0.00	0.00	250.00
3	100.00	30.00	30.00	250.00	0.00	0.00	0.00	250.00
4	100.00	30.00	30.00	250.00	0.00	0.00	0.00	250.00
5	100.00	30.00	30.00	250.00	0.00	0.00	0.00	250.00
6	100.00	20.00	20.00	130.00	0.00	0.00	0.00	130.00
7	100.00	20.00	20.00	40.00	0.00	0.00	0.00	100.00
8	100.00	15.00	15.00	30.00	0.00	0.00	0.00	100.00
9	94.50	15.00	15.00	25.00	0.00	0.00	0.00	94.50
10	100.00	30.00	30.00	90.00	0.00	0.00	0.00	100.00
11	100.00	30.00	30.00	250.00	0.00	0.00	0.00	250.00
12	100.00	30.00	30.00	250.00	0.00	0.00	0.00	250.00

DETAILED REPORT ON THE WATER AVAILABILITY CALCULATION
Water Availability as of 6/ 5/2007 for
TUALATIN R > WILLAMETTE R - AT GAGE 14206500

Watershed ID #: 30201013 Basin: WILLAMETTE Exceedance Level: 80
Time: 09:44 Date: 06/05/2007

Month	Natural Stream Flow	Consumptiv Use and Storage	Expected Stream Flow	Reserved Stream Flow	Instream Require-ments	Net Water Available
1	1090.00	286.00	805.00	0.00	100.00	705.00
2	1420.00	356.00	1060.00	0.00	100.00	964.00
3	1140.00	255.00	886.00	0.00	100.00	786.00
4	676.00	222.00	454.00	0.00	100.00	354.00
5	332.00	212.00	120.00	0.00	100.00	19.90
6	179.00	296.00	-117.00	0.00	100.00	-217.00
7	80.90	328.00	-247.00	0.00	100.00	-347.00
8	44.30	312.00	-267.00	0.00	100.00	-367.00
9	54.20	266.00	-212.00	0.00	94.50	-307.00

10	69.40	152.00	-81.90	0.00	100.00	-182.00
11	160.00	195.00	-35.00	0.00	100.00	-135.00
12	758.00	289.00	469.00	0.00	100.00	369.00
Stor-50%	751000	190700	604000	0	72100	562000

DETAILED REPORT OF CONSUMPTIVE USES AND STORAGES
Water Availability as of 6/ 5/2007 for
TUALATIN R > WILLAMETTE R - AT GAGE 14206500

Watershed ID #: 30201013 Basin: WILLAMETTE Exceedance Level: 80
Time: 09:44 Date: 06/05/2007

Mo	Storage	Irrig	Munic	Ind/Man	Commer	Domest	Agricul	Other	Total
1	121.00	0.00	134.00	2.28	0.11	1.97	14.90	11.90	286.00
2	191.00	0.00	134.00	2.28	0.11	1.97	14.90	11.90	356.00
3	89.30	0.02	134.00	2.28	0.11	1.97	14.90	11.90	254.00
4	56.60	0.51	134.00	2.28	0.11	1.97	14.90	11.90	222.00
5	0.17	59.30	134.00	2.28	0.11	1.97	3.43	11.00	212.00
6	0.00	75.20	203.00	2.28	0.11	1.97	2.52	11.00	296.00
7	0.00	107.00	203.00	2.28	0.10	1.97	2.52	11.00	328.00
8	0.00	90.70	203.00	2.28	0.10	1.97	2.41	11.00	311.00
9	0.00	45.20	203.00	2.28	0.10	1.97	2.46	11.00	266.00
10	0.49	0.02	134.00	2.28	0.10	1.97	1.62	11.00	151.00
11	43.00	0.00	134.00	2.28	0.10	1.97	2.81	11.00	195.00
12	124.00	0.00	134.00	2.28	0.11	1.97	14.90	11.90	289.00

DETAILED REPORT OF RESERVATIONS FOR CONSUMPTIVE USE
Water Availability as of 6/ 5/2007 for
TUALATIN R > WILLAMETTE R - AT GAGE 14206500

Watershed ID #: 30201013 Basin: WILLAMETTE Exceedance Level: 80
Time: 09:44 Date: 06/05/2007

	Reservations							
APP #	0	0	0	0	0	0	0	TOTAL
Status Use								
1	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
2	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
3	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
4	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
5	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
6	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
7	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
8	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
9	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
10	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
11	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
12	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00

DETAILED REPORT OF INSTREAM REQUIREMENTS
Water Availability as of 6/ 5/2007 for
TUALATIN R > WILLAMETTE R - AT GAGE 14206500

Watershed ID #: 30201013 Basin: WILLAMETTE Exceedance Level: 80
Time: 09:44 Date: 06/05/2007

	ISWRs						
APP #	IS 73538	IS 73539	IS 73540	IS 73541	0	0	0	MAXIMUM
Status	Cert.	Cert.	Cert.	Cert.				
1	100.00	75.00	25.00	30.00	0.00	0.00	0.00	100.00
2	100.00	75.00	25.00	30.00	0.00	0.00	0.00	100.00
3	100.00	75.00	25.00	30.00	0.00	0.00	0.00	100.00
4	100.00	75.00	25.00	30.00	0.00	0.00	0.00	100.00
5	100.00	75.00	25.00	30.00	0.00	0.00	0.00	100.00
6	100.00	75.00	25.00	30.00	0.00	0.00	0.00	100.00
7	100.00	75.00	25.00	30.00	0.00	0.00	0.00	100.00
8	100.00	75.00	25.00	30.00	0.00	0.00	0.00	100.00
9	94.50	75.00	25.00	30.00	0.00	0.00	0.00	94.50
10	100.00	75.00	25.00	30.00	0.00	0.00	0.00	100.00
11	100.00	75.00	25.00	30.00	0.00	0.00	0.00	100.00
12	100.00	75.00	25.00	30.00	0.00	0.00	0.00	100.00

DETAILED REPORT ON THE WATER AVAILABILITY CALCULATION
Water Availability as of 6/ 5/2007 for
DAIRY CR > TUALATIN R - AT MOUTH

Watershed ID #: 30201002 Basin: WILLAMETTE Exceedance Level: 80
Time: 09:44 Date: 06/05/2007

Month	Natural Stream Flow	Consumptiv Use and Storage	Expected Stream Flow	Reserved Stream Flow	Instream Require-ments	Net Water Available
1	390.00	39.40	351.00	0.00	10.00	341.00
2	512.00	40.80	471.00	0.00	10.00	461.00
3	417.00	38.40	379.00	0.00	10.00	369.00
4	245.00	36.80	208.00	0.00	10.00	198.00
5	116.00	54.60	61.40	0.00	10.00	51.40
6	61.40	62.20	-0.76	0.00	10.00	-10.80
7	26.10	77.30	-51.10	0.00	10.00	-61.10
8	21.20	69.30	-48.10	0.00	10.00	-58.10
9	20.60	47.90	-27.30	0.00	10.00	-37.30
10	26.40	25.80	0.59	0.00	10.00	-9.41
11	36.70	26.20	10.50	0.00	10.00	0.47
12	239.00	39.30	200.00	0.00	10.00	190.00
Stor-50%	278000	33700	250000	0	7240	244000

DETAILED REPORT OF CONSUMPTIVE USES AND STORAGES
Water Availability as of 6/ 5/2007 for
DAIRY CR > TUALATIN R - AT MOUTH

Watershed ID #: 30201002 Basin: WILLAMETTE Exceedance Level: 80
Time: 09:44 Date: 06/05/2007

Mo	Storage	Irrig	Munic	Ind/Man	Commer	Domest	Agricul	Other	Total
1	4.73	0.00	12.10	0.61	0.11	1.20	8.79	11.90	39.40
2	6.10	0.00	12.10	0.61	0.11	1.20	8.79	11.90	40.80
3	3.68	0.00	12.10	0.61	0.11	1.20	8.79	11.90	38.40
4	2.04	0.09	12.10	0.61	0.11	1.20	8.79	11.90	36.80
5	0.02	28.00	12.10	0.61	0.11	1.20	1.65	11.00	54.70
6	0.00	35.40	12.30	0.61	0.11	1.20	1.51	11.00	62.10
7	0.00	50.50	12.30	0.61	0.10	1.20	1.51	11.00	77.20
8	0.00	42.60	12.30	0.61	0.10	1.20	1.51	11.00	69.30
9	0.00	21.20	12.30	0.61	0.10	1.20	1.51	11.00	47.90
10	0.18	0.01	12.10	0.61	0.10	1.20	0.61	11.00	25.80
11	0.59	0.00	12.10	0.61	0.10	1.20	0.61	11.00	26.20
12	4.56	0.00	12.10	0.61	0.11	1.20	8.79	11.90	39.30

DETAILED REPORT OF RESERVATIONS FOR CONSUMPTIVE USE
Water Availability as of 6/ 5/2007 for
DAIRY CR > TUALATIN R - AT MOUTH

Watershed ID #: 30201002 Basin: WILLAMETTE Exceedance Level: 80
Time: 09:44 Date: 06/05/2007

	Reservations						
APP #	0	0	0	0	0	0	0	TOTAL
Status Use								
1	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
2	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
3	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
4	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
5	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
6	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
7	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
8	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
9	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
10	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
11	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
12	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00

DETAILED REPORT OF INSTREAM REQUIREMENTS
Water Availability as of 6/ 5/2007 for
DAIRY CR > TUALATIN R - AT MOUTH

Watershed ID #: 30201002 Basin: WILLAMETTE Exceedance Level: 80
Time: 09:44 Date: 06/05/2007

APP #	ISWRs						
	IS 73542	0	0	0	0	0	MAXIMUM
Status	Cert.						
1	10.00	0.00	0.00	0.00	0.00	0.00	10.00
2	10.00	0.00	0.00	0.00	0.00	0.00	10.00
3	10.00	0.00	0.00	0.00	0.00	0.00	10.00
4	10.00	0.00	0.00	0.00	0.00	0.00	10.00
5	10.00	0.00	0.00	0.00	0.00	0.00	10.00
6	10.00	0.00	0.00	0.00	0.00	0.00	10.00
7	10.00	0.00	0.00	0.00	0.00	0.00	10.00
8	10.00	0.00	0.00	0.00	0.00	0.00	10.00
9	10.00	0.00	0.00	0.00	0.00	0.00	10.00
10	10.00	0.00	0.00	0.00	0.00	0.00	10.00
11	10.00	0.00	0.00	0.00	0.00	0.00	10.00
12	10.00	0.00	0.00	0.00	0.00	0.00	10.00

DETAILED REPORT ON THE WATER AVAILABILITY CALCULATION
Water Availability as of 6/ 5/2007 for
W FK DAIRY CR > DAIRY CR - AT MOUTH

Watershed ID #: 178 Basin: WILLAMETTE Exceedance Level: 80
Time: 09:44 Date: 06/05/2007

Month	Natural Stream Flow	Consumptiv Use and Storage	Expected Stream Flow	Reserved Stream Flow	Instream Require-ments	Net Water Available
1	136.00	14.50	121.00	0.00	30.00	91.50
2	183.00	15.40	168.00	0.00	30.00	138.00
3	153.00	14.20	139.00	0.00	30.00	109.00
4	88.90	13.60	75.30	0.00	30.00	45.30
5	35.90	19.30	16.60	0.00	30.00	-13.40
6	17.20	21.50	-4.24	0.00	10.00	-14.20
7	5.34	25.50	-20.10	0.00	3.00	-23.10
8	4.03	23.40	-19.40	0.00	2.00	-21.40
9	4.21	17.70	-13.50	0.00	2.00	-15.50
10	5.68	11.90	-6.21	0.00	10.00	-16.20
11	5.26	11.90	-6.67	0.00	30.00	-36.70
12	78.60	14.60	64.10	0.00	30.00	34.10
Stor-50%	104000	12280	94400	0	14300	83200

DETAILED REPORT OF CONSUMPTIVE USES AND STORAGES
Water Availability as of 6/ 5/2007 for
W FK DAIRY CR > DAIRY CR - AT MOUTH

Watershed ID #: 178 Basin: WILLAMETTE Exceedance Level: 80
Time: 09:44 Date: 06/05/2007

Mo	Storage	Irrig	Munic	Ind/Man	Commer	Domest	Agricul	Other	Total
1	1.66	0.00	0.09	0.41	0.02	0.30	0.14	11.90	14.50
2	2.47	0.00	0.09	0.41	0.02	0.30	0.14	11.90	15.30
3	1.38	0.00	0.09	0.41	0.02	0.30	0.14	11.90	14.20
4	0.75	0.00	0.09	0.41	0.02	0.30	0.14	11.90	13.60
5	0.00	7.42	0.09	0.41	0.02	0.30	0.03	11.00	19.30
6	0.00	9.41	0.27	0.41	0.01	0.30	0.03	11.00	21.40
7	0.00	13.40	0.27	0.41	0.00	0.30	0.03	11.00	25.40
8	0.00	11.40	0.27	0.41	0.00	0.30	0.03	11.00	23.40
9	0.00	5.68	0.27	0.41	0.00	0.30	0.03	11.00	17.70
10	0.05	0.00	0.09	0.41	0.01	0.30	0.03	11.00	11.90
11	0.09	0.00	0.09	0.41	0.01	0.30	0.03	11.00	11.90
12	1.67	0.00	0.09	0.41	0.02	0.30	0.14	11.90	14.50

DETAILED REPORT OF RESERVATIONS FOR CONSUMPTIVE USE
Water Availability as of 6/ 5/2007 for
W FK DAIRY CR > DAIRY CR - AT MOUTH

Watershed ID #: 178 Basin: WILLAMETTE Exceedance Level: 80
Time: 09:44 Date: 06/05/2007

	Reservations							
APP #	0	0	0	0	0	0	0	TOTAL
Status Use								
1	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
2	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
3	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
4	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
5	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
6	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
7	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
8	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
9	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
10	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
11	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
12	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00

DETAILED REPORT OF INSTREAM REQUIREMENTS
Water Availability as of 6/ 5/2007 for
W FK DAIRY CR > DAIRY CR - AT MOUTH

Watershed ID #: 178 Basin: WILLAMETTE Exceedance Level: 80
Time: 09:44 Date: 06/05/2007

	ISWRs							
APP #	MF 178	0	0	0	0	0	0	MAXIMUM
Status	Cert.							
1	30.00	0.00	0.00	0.00	0.00	0.00	0.00	30.00
2	30.00	0.00	0.00	0.00	0.00	0.00	0.00	30.00
3	30.00	0.00	0.00	0.00	0.00	0.00	0.00	30.00
4	30.00	0.00	0.00	0.00	0.00	0.00	0.00	30.00
5	30.00	0.00	0.00	0.00	0.00	0.00	0.00	30.00
6	10.00	0.00	0.00	0.00	0.00	0.00	0.00	10.00
7	3.00	0.00	0.00	0.00	0.00	0.00	0.00	3.00
8	2.00	0.00	0.00	0.00	0.00	0.00	0.00	2.00
9	2.00	0.00	0.00	0.00	0.00	0.00	0.00	2.00
10	10.00	0.00	0.00	0.00	0.00	0.00	0.00	10.00
11	30.00	0.00	0.00	0.00	0.00	0.00	0.00	30.00
12	30.00	0.00	0.00	0.00	0.00	0.00	0.00	30.00

1

Application No. G-8476 / 589-106 R-A Permit No. G 7593

STATE OF OREGON WATER RESOURCES DEPARTMENT

Application for a Permit to Appropriate Ground Water

RECEIVED
SEP 20 1977
WATER RESOURCES DEPT
SALEM, OREGON

I, City of Banks, Oregon (Name of Applicant)

of City Hall (Mailing Address), Banks (City)

State of Oregon, 97106 (Zip Code): Phone No. Mayor Howard Steinbach 324-2251 do hereby
Robert Prickett, City Recorder 324-8462

make application for a permit to appropriate the following described ground waters of the State of Oregon:

324 6674

1. The development will consist of one well (Give number of wells, tile lines, infiltration galleries, etc.)

having a diameter of 8 inches and an estimated depth of 450 feet.

2. The well or other source is to be located 135 ft. S (N. or S.) and 560 ft. W (E. or W.)

from the ¼ corner of on the north line of Section 31, T2N, R3W, W.M. (Public Land Survey Corner)

50 HP 645 6" 245 STATIC

(If there is more than one well, each must be described)

~~NW~~ 275 COM. BANKS ½ MI E OF CITY being within the NE ¼ of the NW ¼ of

Sec. 31 Tp. 2N R. 3W, W. M., in the county of Washington

RWK 7/14/95 MDS 589-106

3. Location of area to be irrigated, or place of use if use other than irrigation.

Township	Range	Section	List ¼ ¼ of Section	List use and/or number of acres to be irrigated
SEE ATTACHED SHEET #1				
	22500 GAL	STORAGE		

Large map

4. It is estimated that 210 feet of the well will require 8 5/8" diameter welded steel (Kind) casing.

5. Depth to water table is estimated ..... (Feet) Well drilled by A.M. Jannsen Drilling Co. Aloha, Oregon

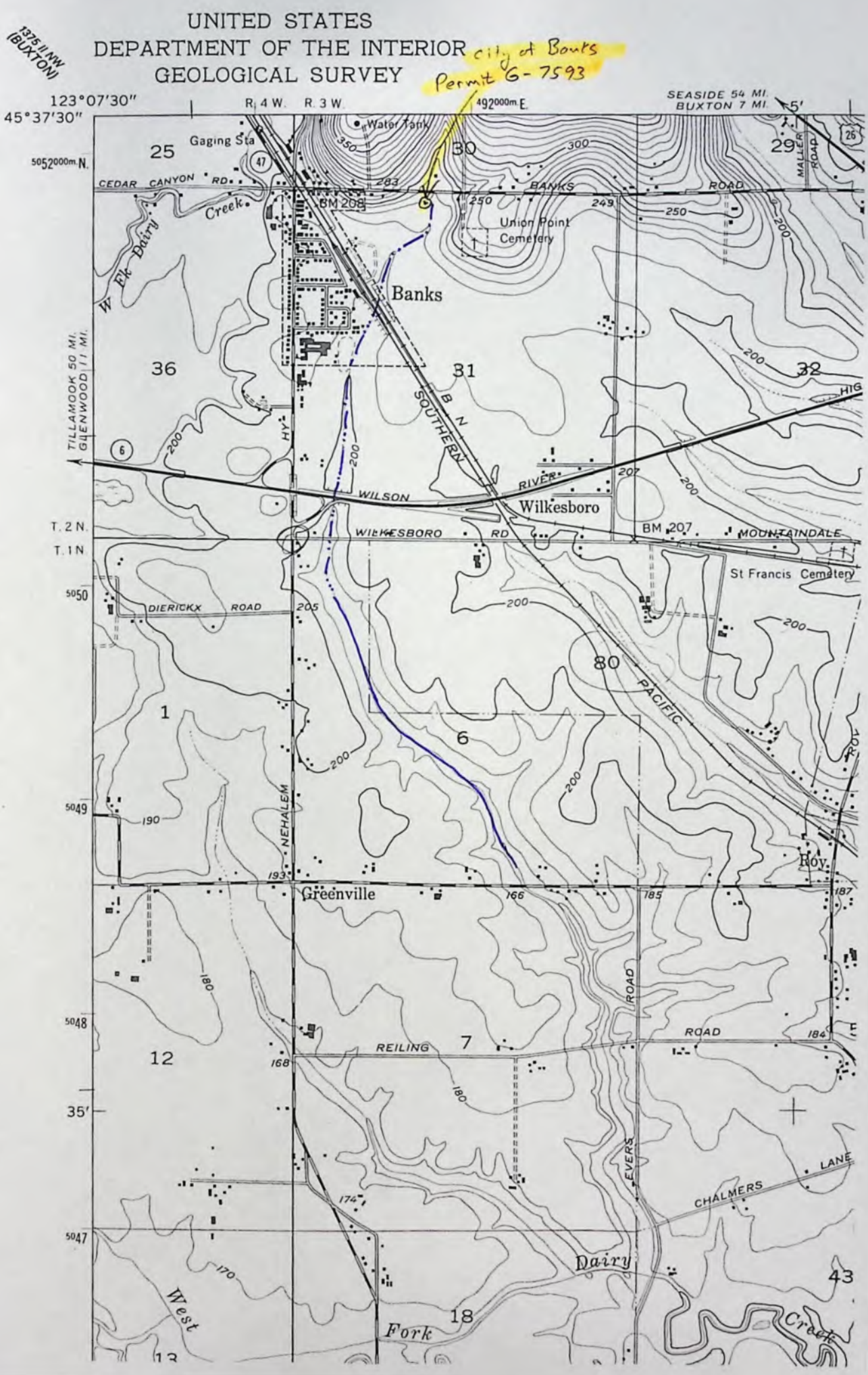
Form 690-3-0-1-77

SHEET #1

3. Location of area to be irrigated, or place of use if use other than irrigation.

Township	Range	Section	List ¼ ¼ of Section
T2N	R3W	29	SW¼ SW¼
T2N	R3W	30	NW¼ SW¼
			SW¼ SW¼
			SE¼ SW¼
			SW¼ SE¼
			SE¼ SE¼
T2N	R3W	31	NW¼ NW¼
			NE¼ NW¼
			NW¼ NE¼
			NE¼ NE¼
			SE¼ NE¼
			SE¼ NW¼
			SW¼ NW¼
			NW¼ SW¼
			SW¼ SW¼
T2N	R3W	32	NW¼ NW¼
			SW¼ NW¼
T2N	R4W	25	NE¼ SE¼
			SE¼ SE¼
			SW¼ SE¼
T2N	R4W	36	NW¼ NE¼
			NE¼ NE¼
			SE¼ NE¼
			NE¼ SE¼
			SE¼ SE¼

Application No. G-8176
Permit No. G 7593


UNITED STATES
DEPARTMENT OF THE INTERIOR
GEOLOGICAL SURVEY
city of Banks
Permit G-7593
1375 II NW (BUXTON)
123°07'30"
45°37'30"
R. 4 W.
R. 3 W.
492000m E.
SEASIDE 54 MI.
BUXTON 7 MI.
5052000m N.
Water Tank
Gaging Sta
CEDAR CANYON RD.
BANKS ROAD
MILLER ROAD
BM 208
Union Point Cemetery
Banks
W. Elk Dairy Creek
TILLAMOOK 50 MI.
GLENWOOD 11 MI.
SOUTHERN P. R.R.
WILSON RIVER
Wilkesboro
WILKESBORO RD.
BM 207
MOUNTAINDALE
St Francis Cemetery
T. 2 N.
T. 1 N.
DIERICKX ROAD
PACIFIC
NEHALEM
Roy
Greenville
REILING ROAD
CHALMERS LANE
EVERS ROAD
West Fork Dairy Creek
25
30
29
36
31
32
1
6
7
12
18
43
13
35'
5050
5049
5048
5047

NOTICE TO WATER WELL CONTRACTOR
The original and first copy of this report are to be filed with the WATER RESOURCES DEPARTMENT, SALEM, OREGON 97310 within 30 days from the date of well completion.

WATER WELL REPORT
STATE OF OREGON
(Please type or print)

RECEIVED
SEP - 6 1977
(Do not write above this line)

WASH 1651

State Well No. 2N/3W-31
State Permit No.

(1) OWNER:
WATER RESOURCES DEPT. SALEM, OREGON
Name City of Banks
Address Banks, Oregon

(2) TYPE OF WORK (check):
New Well ☒ Deepening ☐ Reconditioning ☐ Abandon ☐
If abandonment, describe material and procedure in Item 12.

(3) TYPE OF WELL:
Rotary ☒ Driven ☐
Cable ☐ Jetted ☐
Dug ☐ Bored ☐

(4) PROPOSED USE (check):
Domestic ☐ Industrial ☐ Municipal ☒
Irrigation ☐ Test Well ☐ Other ☐

(5) CASING INSTALLED:
Threaded ☐ Welded ☒
8-5/8" Diam. from plus 2 ft. to 210 ft. Gage .250
" Diam. from ft. to ft. Gage
" Diam. from ft. to ft. Gage

(6) PERFORATIONS:
Perforated? ☐ Yes ☒ No
Type of perforator used
Size of perforations in. by in.
perforations from ft. to ft.
perforations from ft. to ft.
perforations from ft. to ft.

(7) SCREENS:
Well screen installed? ☐ Yes ☒ No
Manufacturer's Name
Type Model No.
Diam. Slot size Set from ft. to ft.
Diam. Slot size Set from ft. to ft.

(8) WELL TESTS:
Drawdown is amount water level is lowered below static level
Was a pump test made? ☒ Yes ☐ No If yes, by whom? AMJannsen
Yield: 275 gal./min. with 224 ft. drawdown after 48 hrs.
150 " 146 " "
" " " "
Bailer test gal./min. with ft. drawdown after hrs.
Artesian flow g.p.m.
Temperature of water 58° Depth artesian flow encountered ft.

(9) CONSTRUCTION:
Well seal—Material used Cement grout & 2% gel
Well sealed from land surface to 210 ft.
Diameter of well bore to bottom of seal 12-1/4" in.
Diameter of well bore below seal 8" in.
Number of sacks of cement used in well seal 25 sacks
How was cement grout placed? Placed on o.d. of casing & through grout pipe - 20 sacks run @ 210', 5 sacks run to top off at ground level upon completion
Was a drive shoe used? ☐ Yes ☒ No Plugs Size: location ft.
Did any strata contain unusable water? ☒ Yes ☐ No
Type of water? insufficient depth of strata 130' to 160'
Method of sealing strata off cased and cemented
Was well gravel packed? ☐ Yes ☒ No Size of gravel:
Gravel placed from ft. to ft.

(10) LOCATION OF WELL:
County Washington Driller's well number
¼ ¼ Section 31 T. 2 N R. 3 W. W.M.
Bearing and distance from section or subdivision corner

(11) WATER LEVEL: Completed well.
Depth at which water was first found 130 ft.
Static level 34 ft. below land surface. Date 8/24/77
Artesian pressure lbs. per square inch. Date

(12) WELL LOG:
Diameter of well below casing 8"
Depth drilled 450 ft. Depth of completed well 450 ft.

Formation: Describe color, texture, grain size and structure of materials; and show thickness and nature of each stratum and aquifer penetrated, with at least one entry for each change of formation. Report each change in position of Static Water Level and indicate principal water-bearing strata.

MATERIAL	From	To	SWL
Dark brown clay topsoil	0	8	
Silty brown clay	8	15	
Red-brown clay w/rotten rock fragments	15	50	
Sticky red clay-occ. rotten rock streaks	50	95	
Brown clay & rotten rock	95	110	
Dark brown & gray-brown clay --organic material	110	120	
Soft blue-gray cemented gravel	120	130	
Rotten brown basalt	130	160	20 gpm
Soft brown basalt-occ.weathered	160	195	
Black-brown basalt	195	215	
Hard gray-black basalt	215	230	
Broken brown basalt w/soapstone and lava interbeds	230	245	10 gpm
Fractured black basalt--occ. crevice	245	265	
Hard gray-black basalt, occ-			

Work started 8/16/77 19 Completed 8/24/77 19
Date well drilling machine moved off of well 8/24/77 19

Drilling Machine Operator's Certification:
This well was constructed under my direct supervision. Materials used and information reported above are true to my best knowledge and belief.
[Signed] (Drilling Machine Operator) Date 8/29/77, 19
Drilling Machine Operator's License No. 528

Water Well Contractor's Certification:
This well was drilled under my jurisdiction and this report is true to the best of my knowledge and belief.
Name A. M. Jannsen Drilling Co. (Person, firm or corporation) (Type or print)
Address 21075 SW Tualatin Valley Hwy. Aloha, Oregon
[Signed] Edward M Jannsen (Water Well Contractor)
Contractor's License No. 79 Date 8/29/77, 19

(USE ADDITIONAL SHEETS IF NECESSARY)

SP*45656-119

NOTICE TO WATER WELL CONTRACTOR
The original and first copy of this report are to be filed with the WATER RESOURCES DEPARTMENT, SALEM, OREGON 97310 within 30 days from the date of well completion.

RECEIVED
SEP - 6 1977
WATER RESOURCES DEPT.
SALEM, OREGON

WATER WELL REPORT
STATE OF OREGON
(Please type or print)
(Do not write above this line)

State Well No. 2N/3W-31

State Permit No.

(1) OWNER:
Name City of Banks Page 2

Address

(2) TYPE OF WORK (check):
New Well ☐ Deepening ☐ Reconditioning ☐ Abandon ☐

If abandonment, describe material and procedure in Item 12.

(3) TYPE OF WELL:
Rotary ☐ Driven ☐
Cable ☐ Jetted ☐
Dug ☐ Bored ☐

(4) PROPOSED USE (check):
Domestic ☐ Industrial ☐ Municipal ☐
Irrigation ☐ Test Well ☐ Other ☐

(5) CASING INSTALLED:
Threaded ☐ Welded ☐

_____" Diam. from _____ ft. to _____ ft. Gage _____

_____" Diam. from _____ ft. to _____ ft. Gage _____

_____" Diam. from _____ ft. to _____ ft. Gage _____

(6) PERFORATIONS:
Perforated? ☐ Yes ☐ No.

Type of perforator used

Size of perforations _____ in. by _____ in.

_____ perforations from _____ ft. to _____ ft.

_____ perforations from _____ ft. to _____ ft.

_____ perforations from _____ ft. to _____ ft.

(7) SCREENS:
Well screen installed? ☐ Yes ☐ No

Manufacturer's Name

Type _____ Model No. _____

Diam. _____ Slot size _____ Set from _____ ft. to _____ ft.

Diam. _____ Slot size _____ Set from _____ ft. to _____ ft.

(8) WELL TESTS:
Drawdown is amount water level is lowered below static level

Was a pump test made? ☐ Yes ☐ No If yes, by whom?

Yield: _____ gal./min. with _____ ft. drawdown after _____ hrs.

" " " "

" " " "

Bailer test _____ gal./min. with _____ ft. drawdown after _____ hrs.

Artesian flow _____ g.p.m.

Temperature of water Depth artesian flow encountered _____ ft.

(9) CONSTRUCTION:
Well seal—Material used

Well sealed from land surface to _____ ft.

Diameter of well bore to bottom of seal _____ in.

Diameter of well bore below seal _____ in.

Number of sacks of cement used in well seal _____ sacks

How was cement grout placed?

Was a drive shoe used? ☐ Yes ☐ No Plugs _____ Size: location _____ ft.

Did any strata contain unusable water? ☐ Yes ☐ No

Type of water? _____ depth of strata _____

Method of sealing strata off

Was well gravel packed? ☐ Yes ☐ No Size of gravel: _____

Gravel placed from _____ ft. to _____ ft.

(10) LOCATION OF WELL:
County _____ Driller's well number _____

¼ ¼ Section _____ T. _____ R. _____ W.M.

Bearing and distance from section or subdivision corner

(11) WATER LEVEL: Completed well.
Depth at which water was first found _____ ft.

Static level _____ ft. below land surface. Date _____

Artesian pressure _____ lbs. per square inch. Date _____

(12) WELL LOG:
Diameter of well below casing _____

Depth drilled _____ ft. Depth of completed well _____ ft.

Formation: Describe color, texture, grain size and structure of materials; and show thickness and nature of each stratum and aquifer penetrated, with at least one entry for each change of formation. Report each change in position of Static Water Level and indicate principal water-bearing strata.

MATERIAL	From	To	SWL
fracture	265	315	5 gpm
Brown basalt-occ.broken	315	325	10 gpm
Hard black & gray-black basalt-occ. crevice	325	360	
Black basalt--occ. broken w/ green soapstone	360	380	25 gpm
Broken black & brown basalt-w/ lava & soapstone interbed	380	400	200 gpm
Broken gray-brown basalt w/ lava streaks	400	415	100gpm
Hard gray-black basalt--occ. crevice	415	450	

Work started _____ 19 _____ Completed _____ 19 _____

Date well drilling machine moved off of well _____ 19 _____

Drilling Machine Operator's Certification:

This well was constructed under my direct supervision. Materials used and information reported above are true to my best knowledge and belief.

[Signed] _____ Date _____, 19_____
(Drilling Machine Operator)

Drilling Machine Operator's License No. _____

Water Well Contractor's Certification:

This well was drilled under my jurisdiction and this report is true to the best of my knowledge and belief.

Name _____
(Person, firm or corporation) (Type or print)

Address _____

[Signed] _____
(Water Well Contractor)

Contractor's License No. _____ Date _____, 19_____

(USE ADDITIONAL SHEETS IF NECESSARY)

SP*45656-119

Application No. G-8476 Permit No. G 7593

Permit to Appropriate the Public Waters of the State of Oregon

This is to certify that I have examined the foregoing application and do hereby grant the same, SUBJECT TO EXISTING RIGHTS INCLUDING THE EXISTING MINIMUM FLOW POLICIES ESTABLISHED BY THE WATER POLICY REVIEW BOARD and the following limitations and conditions:

The right herein granted is limited to the amount of water which can be applied to beneficial use and shall not exceed ~~0.67~~ .613 *cubic feet per second measured at the point of diversion from the well or source of appropriation, or its equivalent in case of rotation with other water users, from* a well

The use to which this water is to be applied is municipal.

If for irrigation, this appropriation shall be limited to ..... *of one cubic foot per second or its equivalent for each acre irrigated and shall be further limited to a diversion of not to exceed* ..... *acre feet per acre for each acre irrigated during the irrigation season of each year;*

and shall be subject to such reasonable rotation system as may be ordered by the proper state officer.

The well shall be constructed in accordance with the General Standards for the Construction and Maintenance of Water Wells in Oregon.

The works constructed shall include an air line and pressure gauge or an access port for measuring line, adequate to determine water level elevation in the well at all times.

The permittee shall install and maintain a weir, meter, or other suitable measuring device, and shall keep a complete record of the amount of ground water withdrawn.

The priority date of this permit is September 29, 1977

Actual construction work shall begin on or before December 2, 1978 *and shall thereafter be prosecuted with reasonable diligence and be completed on or before October 1, 19*79

*Complete application of the water to the proposed use shall be made on or before October 1, 19*80

WITNESS my hand this 2nd *day of* December, *19*77

James E. Sexson

Water Resources Director

4

Oregon
Theodore R. Kulongoski, Governor

Water Resources Department
North Mall Office Building
725 Summer Street NE, Suite A
Salem, OR 97301-1266
503-986-0900
FAX 503-986-0904

May 22, 2007

REFERENCE: Application for Extension of Time

Dear Extension of Time Applicant:

The Water Rights Section has received your application for an extension of time for **APPLICATION FILE #** G-8476 **(PERMIT #** G-7593). Your application will be reviewed in the near future. Following the review, you will receive a Proposed Final Order either approving or rejecting the extension of time request. A 45-day protest period begins upon issuance of the Proposed Final Order. After the protest period closes, a Final Order is issued.

If you have questions concerning your extension of time application, please contact Kim French at (503) 986-0813. For general information about the Water Resources Department, you may contact the Water Resources' Customer Service Group at (503) 986-0801 or you may access the Department's Internet home page at: "**www.wrd.state.or.us**".

Appl File G-8476

Oregon
Theodore R. Kulongoski, Governor

Water Resources Department
North Mall Office Building
725 Summer Street NE, Suite A
Salem, OR 97301-1266
503-986-0900
FAX 503-986-0904

March 26, 2007

City Of Banks
Attn: Michael Lyda
100 S. Main Street
Banks, OR 97106

REFERENCE: Permit Amendment Application T-10055

Dear Mr. Lyda:

On December 28, 2005, the City of Banks submitted a permit amendment application (T-10055) to the Department that proposes to add a point of appropriation under water use Permit G-7593 (Application G-8476). Unfortunately, the Department is unable to process your permit amendment request because the permitted dates for completion of construction and complete application of water to beneficial use have expired. The permit required construction to be completed by October 1, 1979, and the application of water to full beneficial use to be accomplished by October 1, 1980.

If you still wish to make the changes proposed in the permit amendment application (T-10055), ***you must first submit a Permit Extension of Time Application and receive Department approval of the time extension before we may begin processing the permit amendment application.*** Please be aware that the Department currently has a backlog, and it could take several years before we are able to process a request for a permit extension of time. However, you may request that review of the extension of time application be expedited through the Reimbursement Authority process. Information describing the Reimbursement Authority process is enclosed for your review. If you are interested in pursuing the expedited permit extension of time process, you may contact Gerry Clark at (503) 986-0811.

Alternatively, you may choose to proceed with the certification of Permit G-7593 and then convert the pending permit amendment to a transfer application in order to add a proposed point of diversion to the certificated water right. The Department's final proof survey (dated July 14, 1993) for Permit G-7593 indicates that a certificate could be issued at this time for 0.613 cubic foot per second (cfs) out of the permitted 0.67 cfs of water. If you choose to proceed with this option, you would need to revise the permit amendment application and submit additional information, as needed, in order to convert the permit amendment to a transfer application. Please note that the certificate would need to be issued ***before*** we could begin processing the transfer application.

Proposed

Water Right and Adjudications Division

Oregon Water Resources Department

Memo

To: Application File Number G 8476

From: Dwight French DWF

Date: 6/23/06

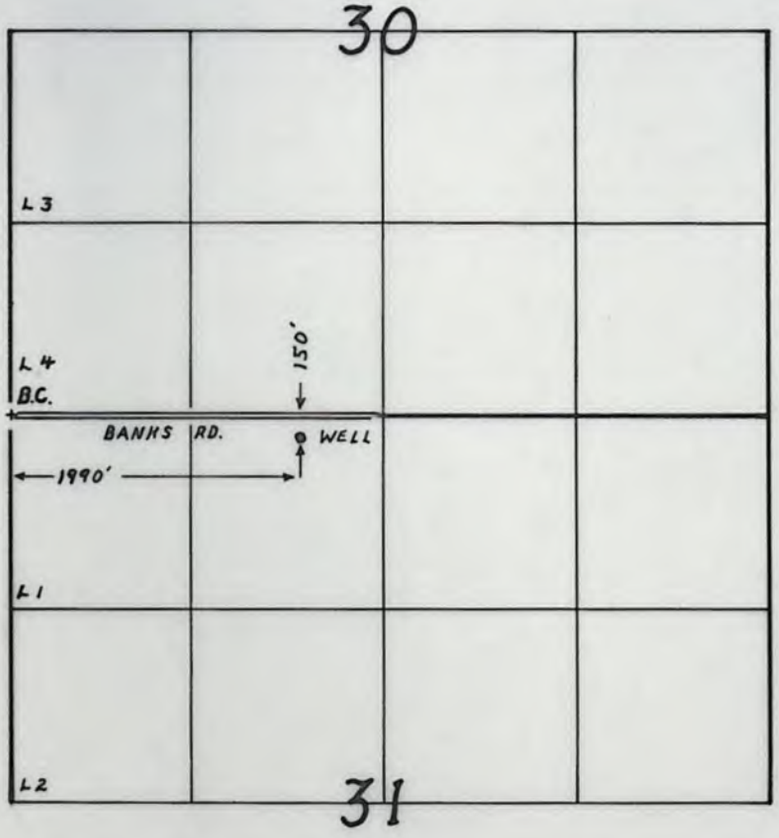
Re: Proof To The Satisfaction Documentation (Certificate Issuance)

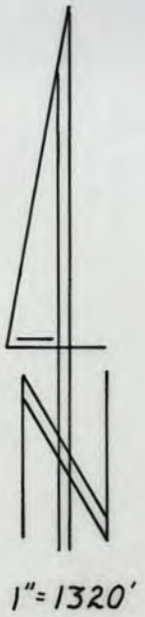
Based on a review of the information in the file, proof to the satisfaction has been made. We should issue a proposed ✓ or final _____ certificate in the amount of 0.613 cfs.

The place of use for the certificate shall be 1) as listed on the permit ✓ 2) as described on the final proof map _____ 3) other: _____

The POD(s) or POA(s) should be 1) as listed on the permit _____ 2) as described on the final proof map X 3) other:

T. 2 N., R. 3 W., W.M.





1"= 1320'

FINAL PROOF SURVEY

UNDER

Application No. G-8476 Permit No. G-7593
IN NAME OF

CITY OF BANKS

Surveyed JULY 14, 1993, by R.W. Klassen

H1067 SB9 106L AWK 12/93

STATE OF OREGON

COUNTY OF WASHINGTON

PROPOSED CERTIFICATE OF WATER RIGHT

DRAFT

THIS CERTIFICATE ISSUED TO

CITY OF BANKS
150 NE BANKS ROAD
BANKS, OREGON 97106

confirms the right to use the waters of A WELL in the EAST FORK DAIRY CREEK BASIN for MUNICIPAL USE.

This right was perfected under Permit G-7593. The date of priority is SEPTEMBER 29, 1977. This right is limited to 0.613 CUBIC FOOT PER SECOND or its equivalent in case of rotation, measured at the well.

The well is located as follows:

NE 1/4 NW 1/4, SECTION 31, T 2 N, R 3 W, W.M.; 150 FEET SOUTH AND 1990 FEET EAST OF NORTHWEST CORNER OF SECTION 31.

The use shall conform to such reasonable rotation system as may be ordered by the proper state officer.

A description of the place of use to which this right is appurtenant is as follows:

WITHIN THE SERVICE BOUNDARIES OF THE CITY

The right to use water for the above purpose is restricted to beneficial use on the lands or place of use described.

DRAFT

INFO: CITY OF BANKS

SOURCE: A WELL

DIV PT: 645 FT DEEP 6" WELL W/ 245 FT STATIC
PUMPED TO 225,000 GAL STORAGE

MOTOR: } 50 HP SUBMERSIBLE
PUMP: }

USE: MUNICIPAL 275 GPM MAX

LIFT: 245 FT STATIC

TIE: 41067 589 106 L

Russell W Klar
WRI 2/14/93

$\frac{50 \times 704}{381 + 245} = 1.24$ PUMP

MAX USE
$\frac{275}{448.8} = .613$ MAX

.67 PERMIT

Application No. G-8476 Permit No. G 7593

Permit to Appropriate the Public Waters of the State of Oregon

This is to certify that I have examined the foregoing application and do hereby grant the same, SUBJECT TO EXISTING RIGHTS INCLUDING THE EXISTING MINIMUM FLOW POLICIES ESTABLISHED BY THE WATER POLICY REVIEW BOARD and the following limitations and conditions:

The right herein granted is limited to the amount of water which can be applied to beneficial use and shall not exceed 0.67 *cubic feet per second measured at the point of diversion from the well or source of appropriation, or its equivalent in case of rotation with other water users, from* a well

The use to which this water is to be applied is municipal.

If for irrigation, this appropriation shall be limited to ..... of one cubic foot per second or its equivalent for each acre irrigated and shall be further limited to a diversion of not to exceed ..... acre feet per acre for each acre irrigated during the irrigation season of each year;

and shall be subject to such reasonable rotation system as may be ordered by the proper state officer.

The well shall be constructed in accordance with the General Standards for the Construction and Maintenance of Water Wells in Oregon.

The works constructed shall include an air line and pressure gauge or an access port for measuring line, adequate to determine water level elevation in the well at all times.

The permittee shall install and maintain a weir, meter, or other suitable measuring device, and shall keep a complete record of the amount of ground water withdrawn.

The priority date of this permit is September 29, 1977

Actual construction work shall begin on or before December 2, 1978 *and shall thereafter be prosecuted with reasonable diligence and be completed on or before October 1, 19*79

*Complete application of the water to the proposed use shall be made on or before October 1, 19*80

WITNESS my hand this 2nd *day of* December, *19*77

James E. Sexson
Water Resources Director

Application No. G-8476 Permit No. G 7593

STATE OF OREGON WATER RESOURCES DEPARTMENT

Application for a Permit to Appropriate Ground Water

RECEIVED
SEP 20 1977
WATER RESOURCES DEPT
SALEM, OREGON

I, City of Banks, Oregon (Name of Applicant)

of City Hall (Mailing Address), Banks (City),

State of Oregon, 97106 (Zip Code) Phone No. Mayor Howard Steinbach 324-2251 do hereby
Robert Prickett, City Recorder 324-8462

make application for a permit to appropriate the following described ground waters of the State of Oregon:

1. The development will consist of one well (Give number of wells, tile lines, infiltration galleries, etc.)

having a diameter of 8 inches and an estimated depth of 450 feet.

2. The well or other source is to be located 135 ft. S (N. or S.) and 560 ft. W (E. or W.)

from the ¼ corner of X on the north line of Section 31, T2N, R3W, W.M. (Public Land Survey Corner)

(If there is more than one well, each must be described)

being within the NE ¼ of the NW ¼ of

Sec. 31 Tp. 2N R. 3W, W. M., in the county of Washington

3. Location of area to be irrigated, or place of use if use other than irrigation.

Township	Range	Section	List ¼ ¼ of Section	List use and/or number of acres to be irrigated
SEE ATTACHED	SHEET #1			

4. It is estimated that 210 feet of the well will require 8 5/8" diameter welded steel (Kind) casing.

5. Depth to water table is estimated ..... (Feet) Well drilled by A.M. Jannsen Drilling Co. Aloha, Oregon

Form 690-3-0-1-77

6. *The amount of water which the applicant intends to apply to beneficial use is* ..... *cubic feet per second or* ....300..... *gallons per minute.*

7. *The use to which the water is to be applied is* ..municipal.....

.....

8. *If the flow to be utilized is artesian, the works to be used for the control and conservation of the supply when not in use must be described.*

(not artesian)

9. *If the location of the well, or other development work is less than one-fourth mile from a natural stream channel, give the distance to the channel and the difference in elevation between the stream bed and the ground surface at the source of development.*

Natural stream channel (intermittent flow) 130 feet due east of well. Well is 10 feet higher than streambed.

10. *DESCRIPTION OF WORKS*

Include length and dimensions of supply ditch or pipeline, size and type of pump and motor, type of irrigation system to adequately describe the proposed distribution system.

Water will be conveyed from well to existing city reservoir (as shown on attached map) through an 8-inch pipeline.

The proposed well pump will be a 40 H.P., 14 stage deep well turbine capable of delivering 300 gallons per minute to a 400 ft. T.D.H.

11. *Construction work will begin on or before* Well construction - August 16, 1977 Pump & pipeline - January, 1978

12. *Construction work will be completed on or before* Well construction - August 24, 1977 Pump & pipeline - June, 1978

13. *The water will be completely applied to the proposed use on or before* July, 1978

14. *If the ground water supply is supplemental to an existing supply, identify the supply and existing water right.* See attached map showing existing water supply system. Water right certificate no. 5353.

Application No. 6-8476 *Permit No.* G 7593

SHEET #1

3. Location of area to be irrigated, or place of use if use other than irrigation.

Township	Range	Section	List ¼ ¼ of Section
T2N	R3W	29	SW¼ SW¼
T2N	R3W	30	NW¼ SW¼
			SW¼ SW¼
			SE¼ SW¼
			SW¼ SE¼
			SE¼ SE¼
T2N	R3W	31	NW¼ NW¼
			NE¼ NW¼
			NW¼ NE¼
			NE¼ NE¼
			SE¼ NE¼
			SE¼ NW¼
			SW¼ NW¼
			NW¼ SW¼
			SW¼ SW¼
T2N	R3W	32	NW¼ NW¼
			SW¼ NW¼
T2N	R4W	25	NE¼ SE¼
			SE¼ SE¼
			SW¼ SE¼
T2N	R4W	36	NW¼ NE¼
			NE¼ NE¼
			SE¼ NE¼
			NE¼ SE¼
			SE¼ SE¼

Application No. G-8176
Permit No. G 7593

Remarks: SEE ATTACHED SHEET #2

Howard D. Steinbock Mayor
Signature of Applicant
City of Banks, Banks Or.

This is to certify that I have examined the foregoing application, together with the accompanying maps and data, and return the same for

In order to retain its priority, this application must be returned to the Water Resources Director with corrections on or before, 19

WITNESS my hand this day of, 19

Water Resources Director

By

This instrument was first received in the office of the Water Resources Director at Salem, Oregon, on the 29TH *day of* SEPTEMBER, 19 77, *at* 8:00 *o'clock* A *M.*

Application No. G-8476 *Permit No.* G 7593

SHEET #2

REMARKS:

The City of Banks presently obtains it's water supply from springs about 4 miles north of the City (see Water Right Certificate No. 5353 and attached map). The present supply is not sufficient to meet summer-time needs; therefore a new well was constructed. At present, Banks supplys water to 747 persons and in year 2000 it is estimated that 1,971 persons will be served. Average day water requirements are presently 104,500 G.P.D. and in year 2000 it is estimated to be 276,000 G.P.D.

Requirements of the average day of the maximum month are presently 200,000 G.P.D. and in year 2000 it is estimated to be 524,000 G.P.D. The present supply (springs) can provide 173,000 G.P.D. and the proposed well can supply 432,000 G.P.D. for a total of 605,000 G.P.D. which will meet the estimated needs in year 2000.

Application No. G-8476
Permit No.

Laura A. Schroeder
Licensed in Oregon, Idaho, Nevada and Washington

V. Scott Borison, Ph.D.
Firm Administrator

SCHROEDER
LAW OFFICES, P.C.

Lynn L. Steyaert
Licensed in Oregon and Nevada

Cortney D. Duke
Licensed in Oregon

October 19, 2006

VIA FACSIMILE AND U.S. MAIL

CITY of BANKS
APP G 8476
PER G 7593
&
T 10055
KELLY STARNES

Oregon Water Resources Department
725 Summer Street N.E. Suite A
Salem, OR 97301-4172
ATTN: Herb Mosgar
Fax: (503) 986-0901

RE: Public Records Request

Dear Herb:

Our office makes the following request for public records under the INSPECTION OF PUBLIC RECORDS LAW, ORS 192.410 – 192.530. The requestor is willing to pay up to a maximum of $100 in fees for the requested materials; however, please advise if the cost may exceed that amount. ORS 192.440(3). Otherwise, if there are any fees that occur during duplication of these materials, please enclose an invoice and our bookkeeper will pay upon receipt.

Please make the following files available for review and copying by our office: Permit G-7593, Transfer T-10055 and Permit S-48173 and related files, if any, including partial cancellation, extension requests, or enforcement actions.

Lynn Steyaert, of our office, will be in Salem tomorrow. Please let me know if these files could be available tomorrow by 11 am.

Sincerely,
SCHROEDER LAW OFFICES, P.C.

Brooke A. Carlock

Brooke A. Carlock
Paralegal

BAC:bac
cc: Clients

CITY of BANKS
APP # S 65611
PER # S 48173

[P0004741; 0715.00 BAC]

PODs

POD Loc ID	POD Nbr	POD Name	Src Type	Streamcode	Source	Tributary to	Location (QQ-S-T-R)	River Mile	Lat/ Long	Legal Description	Def	ST Flow	Max Rate	Rate	Max Acre Feet	Acre Feet	POD Type	Status	Remarks	Mapped?
200578	1		WE	UNN STR > W FK DAIRY CR - 02114003000480090020	A WELL	WEST FORK DAIRY CREEK	NENW 31 02.00N 03.00W WM			150 FEET SOUTH AND 1990 FEET EAST FROM NW CORNER, SECTION 31	P	N	0.613	0.613			GW	NC		Not Mapped

Uses from this Point of Diversion

Use	P/S	Priority Date	Start Date	End Date	ST Flow	Rate/Acre	Duty	Max Rate	Rate	Max Acre Feet	Acre Feet	Surface Elevation	Households	Status	Remarks
MU	P	09/29/1977	1/1	12/31	N			0.613	0.613					NC	

Totals:	0.613		0	

Limits

Max Rate CFS	Acre Feet	Rate/Acre	Duty	Acres	Surf Elev	Begin Season	End Season
0.613						1/1	12/31

POUs

POU Use Id	Use	P/S	Priority Date	Use Status	Acres	Remarks	Mapped?
162217	MU	P	09/29/1977	NC			Not Mapped

Acres	QQ	SCTN	Twp	Range	DLC/Lot	Status	Remarks	Taxlot
	NENE	30	2.0 N	3.0 W		NC		
	NWNE	30	2.0 N	3.0 W		NC		
	SWNE	30	2.0 N	3.0 W		NC		
	SENE	30	2.0 N	3.0 W		NC		
	NENW	30	2.0 N	3.0 W		NC		
	NWNW	30	2.0 N	3.0 W		NC		
	SWNW	30	2.0 N	3.0 W		NC		
	SENW	30	2.0 N	3.0 W		NC		
	NESW	30	2.0 N	3.0 W		NC		
	NWSW	30	2.0 N	3.0 W		NC		
	SWSW	30	2.0 N	3.0 W		NC		
	SESW	30	2.0 N	3.0 W		NC		
	NESE	30	2.0 N	3.0 W		NC		
	NWSE	30	2.0 N	3.0 W		NC		
	SWSE	30	2.0 N	3.0 W		NC		
	SESE	30	2.0 N	3.0 W		NC		
	NENE	31	2.0 N	3.0 W		NC		

	NWNE	31	2.0 N	3.0 W		NC		
	SWNE	31	2.0 N	3.0 W		NC		
	SENE	31	2.0 N	3.0 W		NC		
	NENW	31	2.0 N	3.0 W		NC		
	NWNW	31	2.0 N	3.0 W		NC		
	SWNW	31	2.0 N	3.0 W		NC		
	SENW	31	2.0 N	3.0 W		NC		
	NESW	31	2.0 N	3.0 W		NC		
	NWSW	31	2.0 N	3.0 W		NC		
	SWSW	31	2.0 N	3.0 W		NC		
	SESW	31	2.0 N	3.0 W		NC		
	NESE	31	2.0 N	3.0 W		NC		
	NWSE	31	2.0 N	3.0 W		NC		
	SWSE	31	2.0 N	3.0 W		NC		
	SESE	31	2.0 N	3.0 W		NC		
	NENE	36	2.0 N	4.0 W		NC		
	NWNE	36	2.0 N	4.0 W		NC		
	SWNE	36	2.0 N	4.0 W		NC		
	SENE	36	2.0 N	4.0 W		NC		
	NENW	36	2.0 N	4.0 W		NC		
	NWNW	36	2.0 N	4.0 W		NC		
	SWNW	36	2.0 N	4.0 W		NC		
	SENW	36	2.0 N	4.0 W		NC		
	NESW	36	2.0 N	4.0 W		NC		
	NWSW	36	2.0 N	4.0 W		NC		
	SWSW	36	2.0 N	4.0 W		NC		
	SESW	36	2.0 N	4.0 W		NC		
	NESE	36	2.0 N	4.0 W		NC		
	NWSE	36	2.0 N	4.0 W		NC		
	SWSE	36	2.0 N	4.0 W		NC		
	SESE	36	2.0 N	4.0 W		NC		
Total Acres: 0								

Comments

Water Right Genealogy

- Permit: G 7593 *
  - Xfer Filed: T 10055 [CF] (AMN)

1915 NE 39th AVE.
P.O. BOX 12527
PORTLAND, OR 97212-0527

SCHROEDER
LAW OFFICES, P.C.

TELEPHONE (503) 281-4100
FAX (503) 281-4600
WWW.WATER-LAW.COM

To:	Herb Mosgar	Company:	OWRD
Telephone:	+1 (503) 986-0804	Fax:	+1 (503) 986-0901

From:	Brooke A. Carlock	Date:	October 19, 2006
Telephone:	(503) 281-4100	Return Fax:	(503) 281-4600
Subject:	**RE: Public Records Request**		
Pages:	2 (Including Cover Sheet)		

IF YOU HAVE PROBLEMS RECEIVING THIS FAX, PLEASE CALL (503) 281-4100

COMMENTS:

NUMBER _____

_____CHECK _____MO _____CASH

_____ SURFACE

_____ RESERVOIR

_____ GROUND WATER

_____ TRANSFER

_____ COPYING

_____ ASSIGNMENT

_____ EXTENSION OF TIME

_____ CERTIFICATE RECORDING FEE

_____ NO MONEY

_____ OTHER

_____ QUADRANGLE

_____ PROTEST

_____ SPRING DESCRIPTION

CONTRACTORS' EXAM-_____

LICENSE_____

OPERATORS' EXAM _____

LICENSE_____

to money come soon

29 Sep 77

Application No. G 8476

Permit No. G 7593

Name City of Banks

Address City Hall, Banks, OR 97106

Assigned

Address

Beginning construction DEC 2 1978

Completion of construction OCT 1 1979

Extended to

Complete application of water OCT 1 1980

Extended to

Form 111

KLEIN CONSULTING ENGINEERS
Civil Engineers / Planners
1928 Council Street, Forest Grove, Oregon 97116
503/357-4748

September 28, 1977
702-8I

Oregon State Water Resouces Department
Mill Creek Office Park
555 13th NE
Salem, Oregon 97310

RE: Water Right Application
City of Banks, Oregon
Behrman Well

ATTN: Mr. Ves Garner

Dear Mr. Garner,

Enclosed you will find a check #1332 in the amount of $35.00. This check is for examination and recording fees for a water right application filed by the City of Banks, Oregon. The water right application was mailed earlier today but the check was not enclosed with the application. Please have this check placed with the appropriate water right application from the City of Banks.

If you have any questions or need additional information, please give our office a call.

Kindest regards.

Very truly yours,

Norine H. Shimatsu

Norine H. Shimatsu
KLEIN CONSULTING ENGINEERS

Encl.

Application No. G-8476
Permit No.

KLEIN CONSULTING ENGINEERS
Civil Engineers / Planners / Surveyors
1928 Council Street, Forest Grove, Oregon 97116

503/357-4748
357-3107

November 13, 1980

Water Resources Department
Mill Creek Office Park
555 13th. Street N.E.
Salem, Oregon 97310

Dear Sirs:

In reference to your file number G-8476 for the City of Banks we would like to have you send us a Form C to be completed for the City.

This was due on October 1, 1980 so we would like this sent to us as soon as possible.

Sincerely,

Lynn

Lynn Lindekugel
Klein Consulting Engineers

amk:ll

12-16-80
Engineer for Klein said city has used full Q in areas shown on permit

Sent 11-14-80 lms

December 8, 1977

City of Banks
City Hall,
Banks, OR 97106

G 8476

G 7593

378-8508

File No. G-8476

October 24, 1977

City of Banks
City Hall
Banks, OR 97106

Dear Sirs:

We have received your application for a permit to appropriate 300 gallons of water per minute from a well for municipal use of the City of Banks, along with the supporting data, and the fee of $35.00 for which our receipt No. 64202 is enclosed. This application has been filed and assigned No. G-8476.

This application is in satisfactory form for issuance of a permit.

Sincerely

Donald R. Buell
Water Rights Engineer

DRB:cah
cc: Klein Consulting Engineers

KLEIN CONSULTING ENGINEERS
Civil Engineers / Planners
1928 Council Street, Forest Grove, Oregon 97116
503/357-4748

September 27, 1977
702-8I

Oregon State Water Resources Department
Mill Creek Office Park
555 13th NE
Salem, Oregon 97310

RE: Water Right Application
City of Banks, Oregon
Behrman Well

ATTN: Mr. Ves Garner

Dear Mr. Garner,

Transmitted herewith is an application for a permit to appropriate ground water in Banks, Oregon.

If you have any questions or need additional information, please give our office a call.

Kindest regards.

Very truly yours,

A. M. Klein

Application No. G-8476
Permit No.

Andrew M. Klein
KLEIN CONSULTING ENGINEERS

AMK:nhs

cc: Mr. Robert Prickett

Encl.

ELECTRIC LOG BY

Application No. 6-8476
Permit No.

JOHNSON·KECK™ DR·61 ELECTRICAL LOGGING SYSTEM

Well City of Banks Well # 1-AMJ Owner City of Banks, Banks, Oregon

Location Banks Rd - East to Union Cemetary Date 8/16/77

Borehole depth 210 ft. dia. 6 in. Casing depth 10 ft. dia. 10 in.

Mud resistivity — temperature — F

viscosity 30 sec weight 8.5 lb/gal type clear water

Measuring point Five (5) ft. above/[redacted] ground level

Fluid level in hole 25 ft. Other logs none -

Driller A.M. Jannsen Drilling Co - P.A. Jannsen E·log operator P.A. Jannsen

Spontaneous Potential (millivolts)

-400 -200 0 200 400
-100 -50 0 50 100
0 +10 +20 +30

SP

Depth (ft)

1"=10'
1"=20'
1"=40'

Resistivity (ohm - ft)

(Circle one) Normal - Lateral

.25 2.5 10

8000 16000 24000 32000
2000 4000 6000 8000
200 400 600 800
100 200 300 400

0 50 100 150 200

SP	Depth	.25	2.5
35	50	100	60
35		125	90
35	60	80	90
34		150	120
34	70	90	100
32		100	110
31	80	150	100
31		160	100
30	90	190	110
30		160	100
29	100	180	100
28		190	110
25	110	52	90
21		108	100
18	120	108	110
17		88	90
14	130	64	70
15		57	50
13	140	66	70
15		78	80
15	150	58	80
13		95	60
10	160	100	100
9		148	130
10	170	65	80
10		55	50
10	180	65	70
9		85	80
11	190	85	80
10		48	50
8	200	50	50
5		111	100
5	210	118	100

SP

2.5 .25

- 0 Silty Brown Clay
- 15 Red-Brown Clay w/ Rotten Rock fragments
- 50 Red Clay w/ occ. Rotten Rock streaks
- 95 Brown clay & Rotten Rock
- 110 Dark Brown & grey-Brown clay - Organic material
- 120 Blue-grey cement - gravel
- 130 Rotten Brown Basalt (water Bearing)
- 160 Soft Brown Basalt occ. weathered
- 200 grey-black & grey-brown basalt

KLEIN CONSULTING ENGINEERS
Civil Engineers / Planners
1928 Council Street, Forest Grove, Oregon 97116
503/357-4748

September 7, 1977
702-8

Mayor Howard Steinbach
150 NE Banks Road
Banks, Oregon 97106

Application No. 6-8476
Permit No.

RE: Report on Behrman Well

Dear Howard,

Jannsen Drilling has completed it's work on the City well and all reports are in relative to quantity and quality of the water.

In general, the City has an excellent well. It can produce about 300 gallons per minute on a sustained basis. Water quality is very good with the exception of iron content which is 0.4 mg/l as opposed to an E.P.A. standard of 0.3 mg/l. The water would be classified as moderately soft and very satisfactory for domestic use.

WELL CONSTRUCTION

The well has been drilled to a total depth of 450 feet and has been cased (8 inch) and sealed with cement to a depth of 210 feet. Casing and seal extend into the basalt 10 feet.

The well has been disinfected and capped and is now ready to be used as a production well.

A detailed well drillers report is attached.

WATER QUANTITY

The well was test pumped for a period of approximately 48 hours beginning on August 25, 1977 and as previously noted it could be pumped at a sustained rate of 300 G.P.M.

The recovery of the well is very good after the pump has been shut off.

A detailed report and graph showing the results of the well test are appended.

Application No. G-8476
Permit No.

WATER QUALITY

Water quality is very good as previously noted. There are however two areas of concern, iron and hardness.

Iron content of the water is 0.4 mg/l as opposed to a standard of 0.3 mg/l. At this concentration some water users may be able to notice a slightly different taste and there may be slight iron staining of plumbing fixtures. However, a water analysis taken in December 1962 of the City's spring water showed iron in the amount of 0.37 mg/l which is not significantly different than the well. In 1968 an analysis was ran on water from the upper spring which showed iron in the amount of 0.04 mg/l or almost non-existent.

Hardness of water is probably best described on a scale of 0 to 250 with 0 being extremely soft and 250 being too hard for use. Hardness of the well water is 86 which is classed as moderably soft but is harder than the spring water which runs about 33 or 34 and is very soft.

In regard to the iron content, I believe that the 1962 sample from the distribution system is showing iron pick-up from some old iron pipes in the distribution system. An analysis of water taken directly from the spring shows no iron content. In my opinion there is no need to treat the well water for iron removal as when it is mixed with spring water dilution will solve the problem. In time as distribution mains and services are replaced in town any iron pick-up problems will also be solved.

In regard to hardness, I would not be concerned. If the people in Banks used well water exclusively hardness would be noticeable by comparison with spring water. However, where the water will be mixed hardness will not be noticeable.

The Washington County Health Department ran a test on the well water for bacteriological quality and the sample was found to be free of bacteria.

Attached are test results for both chemical and bacteriological quality.

Well water temperature was measured as 58°F. If I remember correctly, the spring water is slightly colder.

WATER RIGHTS

It will be necessary to make application to the Oregon Department of Water Resources for a groundwater right. This should be done immediately so that you can establish your priority for use of the water.

Application No. 6-8476
Permit No.

DEVELOPMENT OF THE GROUNDWATER

The general concept for development of the groundwater is to install a well pump and pump water directly to a reservoir north of Banks. The well would supplement the existing gravity supply which comes from springs about four miles north of Banks. The well pump would be controlled by water level at the reservoir so that the more economical gravity water from the spring would be utilized first and would be supplemented by the well water in times of heavy water demand.

The existing reservoir has a storage capacity of 200,000 gallons. The reservoir is not covered and does not have sufficient capacity to meet present day requirements. In previous reports it has been recommended that the existing reservoir be removed and a new covered reservoir with 500,000 gallon capacity be constructed.

A pipeline would be constructed from the well to connect with the proposed 0.5 MG storage reservoir.

The well water will not require treatment nor disinfection (chlorination).

A second phase to this project which Council has not yet considered is development of the main spring which is located about four miles north of Banks. Development of this spring can be best accomplished by constructing an infiltration gallery and then sealing the spring so that pollution and turbidity can be eliminated. This phase of the work should be done so that current E.P.A. standards relative to water quality can be met on a year around basis.

A very rough preliminary estimate to accomplish the above described work follows:

Well Pump, Well House and Piping Assembly

Submersible pump, discharge column, miscellaneous piping and fittings, check valves, air valve, hose bids, gate valve, bubbler tube, air vent, sanitary well seal, drawdown gauge assembly, water meter, pressure gauge, floor slab, floor drain, heater, pump house, and access road.	$ 22,000

Pipeline from Well House to Reservoir

2,200 LF of 8 inch pipe; pressure testing and disinfection.	26,000
SUBTOTAL I	$ 48,000

Application No. G-8476
Permit No.

	SUBTOTAL I	$ 48,000
500,000 Gallon Reservoir		
Site preparation, construction of reinforced concrete reservoir, ladder, access hatch, ventilator, piping, testing, disinfection and fencing.		130,000
Valve Vault and Miscellaneous Piping at Reservoir		
Concrete valve vault, valve vault cover, pipe, fittings, valves, thrust blocks, connection to existing 10 inch pipeline, miscellaneous appurtenances, disinfection of piping and pressure testing.		16,000
Electrical		
Power supply from Banks Road to meter at well house, control panel in well house, pump controls, water level sensing device in the well, water level sensing device in reservoir, a direct burial cable between pump house and reservoir, and alarm system.		12,000
Infiltration Gallery at Upper Spring		
Access road, site preparation, excavation, perforated piping, filter rock, polyethylene cover, catchbasin, piping, valves, disinfection.		60,000
Demolition and Removal of Existing Reservoir		10,000
	SUBTOTAL	$276,000
Plus 25% for engineering, legal, administrative and contingencies		69,000
	TOTAL ESTIMATED CONSTRUCTION COST	$345,000
Land for reservoir site		5,000
	TOTAL ESTIMATED PROJECT COST	$350,000

Application No. G-8476
Permit No.

The project as outlined above is for complete modernization of the existing supply system and development of the well all in conformity with State and E.P.A. requirements.

It is possible to construct the project in phases. That is, for $75,000 the City could develop the well, install the pipeline from well to existing reservoir and install the electrical controls. At some future time the reservoir could be constructed and the spring developed. I question the advisability of this approach however for two reasons; 1) if inflation continues it would be better to do the entire project and then work on 1977 dollars during the life of a bond issue, 2) the public is generally not responsive to being asked for money a second and third time for the same general project.

If the City of Banks were to construct the entire project as outlined above and borrow the full amount ($350,000) from Farmers Home Administration at 5% interest over 40 years, repayment would be as follows:

Total Annual Payment	$20,397
Average Annual Payment Per Customer (based on 250 customers)	$81.59
Average Monthly Payment Per Customer (based on 250 customers)	$6.80

I checked on a grant from Farmers Home Administration and cannot see this as a possibility. To get a grant the annual payment per customer would have to exceed 1 percent of the average annual family income for Washington County. The average annual family income is $10,366 and one percent is $103.66. However, when applying to FmHA we should ask for a grant.

My recommendation for implementation of the above program is to:

1) File immediately with the Oregon State Department of Water Resources for a permit to use the well water.

2) I would suggest a special meeting with Council sometime during the week of September 18 so that we can arrive at a consensus as to the proposed course of action and then file with the appropriate agencies for funding and necessary approvals.

3) I would suggest that negotiations commence with the Carsten's family for the purchase of one acre of land for a new reservoir site adjacent to the existing reservoir site.

4) Prepare detailed cost estimates for the specific plan that Council wishes to implement.

5) If Council elects to apply to Farmers Home Administration for a loan and a grant the following steps need to be followed:

   a) Apply to State of Oregon Local Government Relations Division and CRAG for A-95 Review.

   b) Submit a pre-application to FmHA for grant and loan.

6) Apply to Washington County for a conditional use permit for reservoir site and well site.

7) Hold a public hearing as soon as practical.

8) Hold a bond election following the public hearing.

9) Proceed with plans and specifications and ask for bids.

I believe this gives you enough general information for the present. I will be ready to go into detail on water rates at the special meeting.

Kindest regards.

Application No. G-8476
Permit No.

Very truly yours,

A. M. Klein

Andrew M. Klein
KLEIN CONSULTING ENGINEERS

AMK:nhs

cc: Robert Prickett
Gordon Vanderzanden

Encl.

WATER WELL CONTRACTOR
Original and first copy of this report are to be filed with the
WATER RESOURCES DEPARTMENT,
SALEM, OREGON 97310
within 30 days from the date of well completion.

WATER WELL REPORT
STATE OF OREGON
(Please type or print)
(Do not write above this line)

Application No. G-8476
Permit No.

State Well No. .....
State Permit No. .....

(1) OWNER:
Name City of Banks
Address Banks, Oregon

(2) TYPE OF WORK (check):
New Well ☑ Deepening ☐ Reconditioning ☐ Abandon ☐
If abandonment, describe material and procedure in Item 12.

(3) TYPE OF WELL:
Rotary ☑ Driven ☐
Cable ☐ Jetted ☐
Dug ☐ Bored ☐

(4) PROPOSED USE (check):
Domestic ☐ Industrial ☐ Municipal ☑
Irrigation ☐ Test Well ☐ Other ☐

(5) CASING INSTALLED:
Threaded ☐ Welded ☑
8-5/8" Diam. from plus 2 ft. to 210 ft. Gage .250
..... " Diam. from ..... ft. to ..... ft. Gage .....
..... " Diam. from ..... ft. to ..... ft. Gage .....

(6) PERFORATIONS:
Perforated? ☐ Yes ☑ No.
Type of perforator used
Size of perforations in. by in.
..... perforations from ..... ft. to ..... ft.
..... perforations from ..... ft. to ..... ft.
..... perforations from ..... ft. to ..... ft.

(7) SCREENS:
Well screen installed? ☐ Yes ☑ No
Manufacturer's Name .....
Type ..... Model No. .....
Diam. ..... Slot size ..... Set from ..... ft. to ..... ft.
Diam. ..... Slot size ..... Set from ..... ft. to ..... ft.

(8) WELL TESTS:
Drawdown is amount water level is lowered below static level
Was a pump test made? ☑ Yes ☐ No If yes, by whom? A.M. Jannsen
Yield: 275 gal./min. with 224 ft. drawdown after 48 hrs.
" 150 " 146 " "
" " " "
Bailer test gal./min. with ft. drawdown after hrs.
Artesian flow g.p.m.
Temperature of water 58° Depth artesian flow encountered ..... ft.

(9) CONSTRUCTION:
Well seal—Material used Cement grout & 2% gel
Well sealed from land surface to 210 ft.
Diameter of well bore to bottom of seal 12-1/4" in.
Diameter of well bore below seal 8" in.
Number of sacks of cement used in well seal 25 sacks
How was cement grout placed? Placed on o.d. of casing through grout pipe - 20 sacks run @ 210', 5 sacks run to top off at ground level upon completion
Was a drive shoe used? ☐ Yes ☑ No Plugs ..... Size: location ..... ft.
Did any strata contain unusable water? ☑ Yes ☐ No
Type of water? insufficient depth of strata 130' to 180'
Method of sealing strata off Cased and cemented
Was well gravel packed? ☐ Yes ☑ No Size of gravel: .....
Gravel placed from ..... ft. to ..... ft.

(10) LOCATION OF WELL:
County Washington Driller's well number
¼ ¼ Section 31 T. 2 N R. 3 W. W.M.
Bearing and distance from section or subdivision corner

(11) WATER LEVEL: Completed well.
Depth at which water was first found 130 ft.
Static level 84 ft. below land surface. Date 8/24/77
Artesian pressure lbs. per square inch. Date

(12) WELL LOG:
Diameter of well below casing 8"
Depth drilled 450 ft. Depth of completed well 450 ft.

Formation: Describe color, texture, grain size and structure of materials; and show thickness and nature of each stratum and aquifer penetrated, with at least one entry for each change of formation. Report each change in position of Static Water Level and indicate principal water-bearing strata.

MATERIAL	From	To	SWL
Dark brown clay topsoil	0	3	
Silty brown clay	3	15	
Red-brown clay w/rotten rock fragments	15	50	
Sticky red clay-occ. rotten rock streaks	50	95	
Brown clay & rotten rock	95	110	
Dark brown & gray-brown clay --organic material	110	120	
Soft blue-gray cemented gravel	120	130	
Rotten brown basalt	130	160	20 gpm
Soft brown basalt-occ. weathered	160	195	
Black-brown basalt	195	215	
Hard gray-black basalt	215	230	
Broken brown basalt w/soapstone and lava interbeds	230	245	10 gpm
Fractured black basalt--occ. crevice	245	265	
Hard gray-black basalt, occ-			

Work started 8/16/77 19 Completed 8/24/77 19
Date well drilling machine moved off of well 8/24/77 19

Drilling Machine Operator's Certification:
This well was constructed under my direct supervision. Materials used and information reported above are true to my best knowledge and belief.
[Signed] ..... (Drilling Machine Operator) Date 8/29/77, 19
Drilling Machine Operator's License No. 823

Water Well Contractor's Certification:
This well was drilled under my jurisdiction and this report is true to the best of my knowledge and belief.
Name A. M. Jannsen Drilling Co. (Person, firm or corporation) (Type or print)
Address 21075 SW Tualatin Valley Hwy., Aloha, Oregon
[Signed] ..... (Water Well Contractor)
Contractor's License No. 70 Date 8/29/77, 19

(USE ADDITIONAL SHEETS IF NECESSARY)

WATER WELL CONTRACTOR

The original and first copy of this report are to be filed with the

WATER RESOURCES DEPARTMENT, SALEM, OREGON 97310 within 30 days from the date of well completion.

WATER WELL REPORT

STATE OF OREGON

(Please type or print)

(Do not write above this line)

Application No. G-8476

Permit No.

State Well No. .....

State Permit No. .....

(1) OWNER:

Name City of Banks Page 2

Address

(2) TYPE OF WORK (check):

New Well ☐ Deepening ☐ Reconditioning ☐ Abandon ☐

If abandonment, describe material and procedure in Item 12.

(3) TYPE OF WELL:

Rotary ☐ Driven ☐
Cable ☐ Jetted ☐
Dug ☐ Bored ☐

(4) PROPOSED USE (check):

Domestic ☐ Industrial ☐ Municipal ☐
Irrigation ☐ Test Well ☐ Other ☐

(5) CASING INSTALLED:

Threaded ☐ Welded ☐

..... " Diam. from ..... ft. to ..... ft. Gage .....
..... " Diam. from ..... ft. to ..... ft. Gage .....
..... " Diam. from ..... ft. to ..... ft. Gage .....

(6) PERFORATIONS:

Perforated? ☐ Yes ☐ No.

Type of perforator used

Size of perforations in. by in.

..... perforations from ..... ft. to ..... ft.
..... perforations from ..... ft. to ..... ft.
..... perforations from ..... ft. to ..... ft.

(7) SCREENS:

Well screen installed? ☐ Yes ☐ No

Manufacturer's Name .....

Type ..... Model No. .....

Diam. ..... Slot size ..... Set from ..... ft. to ..... ft.

Diam. ..... Slot size ..... Set from ..... ft. to ..... ft.

(8) WELL TESTS:

Drawdown is amount water level is lowered below static level

Was a pump test made? ☐ Yes ☐ No If yes, by whom?

Yield: gal./min. with ft. drawdown after hrs.

" " " "

" " " "

Bailer test gal./min. with ft. drawdown after hrs.

Artesian flow g.p.m.

Temperature of water Depth artesian flow encountered ..... ft.

(9) CONSTRUCTION:

Well seal—Material used .....

Well sealed from land surface to ..... ft.

Diameter of well bore to bottom of seal ..... in.

Diameter of well bore below seal ..... in.

Number of sacks of cement used in well seal ..... sacks

How was cement grout placed? .....

Was a drive shoe used? ☐ Yes ☐ No Plugs ..... Size: location ..... ft.

Did any strata contain unusable water? ☐ Yes ☐ No

Type of water? depth of strata

Method of sealing strata off

Was well gravel packed? ☐ Yes ☐ No Size of gravel: .....

Gravel placed from ..... ft. to ..... ft.

(10) LOCATION OF WELL:

County Driller's well number

¼ ¼ Section T. R. W.M.

Bearing and distance from section or subdivision corner

(11) WATER LEVEL: Completed well.

Depth at which water was first found ft.

Static level ft. below land surface. Date

Artesian pressure lbs. per square inch. Date

(12) WELL LOG:

Diameter of well below casing .....

Depth drilled ft. Depth of completed well ft.

Formation: Describe color, texture, grain size and structure of materials; and show thickness and nature of each stratum and aquifer penetrated, with at least one entry for each change of formation. Report each change in position of Static Water Level and indicate principal water-bearing strata.

MATERIAL	From	To	SWL
fracture	265	315	.5 gpm
brown basalt-occ. broken	315	325	10 gpm
hard black & gray-black basalt-occ. crevice	325	360	
Black basalt--occ. broken w/ green soapstone	360	380	25 gpm
Broken black & brown basalt- w/ lava & soapstone interbed	380	400	100 gpm
broken gray-brown basalt w/ lava streaks	400	415	100gpm
hard gray-black basalt--occ. crevice	415	450	

Work started 19 Completed 19

Date well drilling machine moved off of well 19

Drilling Machine Operator's Certification:

This well was constructed under my direct supervision. Materials used and information reported above are true to my best knowledge and belief.

[Signed] ..... Date ....., 19.....
(Drilling Machine Operator)

Drilling Machine Operator's License No. .....

Water Well Contractor's Certification:

This well was drilled under my jurisdiction and this report is true to the best of my knowledge and belief.

Name .....
(Person, firm or corporation) (Type or print)

Address .....

[Signed] .....
(Water Well Contractor)

Contractor's License No. ..... Date ....., 19.....

(USE ADDITIONAL SHEETS IF NECESSARY)

SP*46606-119

Application No. G-8476
Permit No.

RECEIVED
SEP 2 6 1977
WATER RESOURCES DEPT.
SALEM, OREGON

48 HOUR PUMP TEST
CITY OF BANKS

Beginning August 25, 1977
with 3½ Orifice on 5" O.D. Pipe

Time	RPM	Inches/gpm		Water Level	Quality	Temperature
4:00 pm	1500	4½	135	115'	Clear	
4:30	1700	6½	150	110'	Clear	
4:45	1800	7½	160	120'	Clear	
5:00	2500	22	272	180'	Clear	
5:15	2500	20	260	190'	Clear	
5:30	2500	20	"	195'	Clear	
6:00	2500	20	"	205'	Clear	58°
6:15	2500	20	"	205'	Clear	
6:30	2500	19½	255	210'	Clear	
6:45	2500	19½	"	210'	Clear	
7:00	2500	19½	"	210'	Clear	
7:30	2500	19½	"	214'	Clear	
8:00	2500	19½	"	215'	Clear	
8:30	2500	19	"	215'	Clear	
9:00	2500	20	260	230'	Clear	58°
9:30	2100	11	196	175'	Clear	
10:00	2100	11	"	170'	Clear	
11:00	2100	11	"	170'	Clear	
12:00	2100	11	"	170'	"	
8/26/77						
1:00 am	2100	11	196	170'	Clear	
2:00	2100	11	"	170'	"	
3:00	2100	11	"	170'	"	58°
4:00	2100	11	196	170'	"	
5:00	2700	22	272	230'	"	
6:00	2700	22	"	233'	"	
7:00	2700	21½	270	235'	"	58°
8:00	2800	21½	"	240'	"	
9:00	2800	21½	"	245'	"	58°
10:00	2800	21	266	245'	"	
11:00	2800	21	"	245'	"	
12:00	2800	21	"	247'	"	
1:00 pm	2800	21	"	247'	"	
2:00	2800	21	"	247'	"	
3:00	2800	21	"	248'	Clear	58°
4:00	2800	21	"	249'	"	
5:00	2800	20	260	248'	"	
6:00	2800	20½	"	250'	"	
7:00	2800	20	"	250'	"	
8:00	2800	22	272	250'	"	
8:45	2800	22	"	250'	"	
8:45	2100	10	187	Recovering	"	
9:00	2100	10	"	185'	"	
10:00	2100	10	"	185'	"	

Time	RPM	Inches	gpm	Water Level	Quality	Temperature
11:00 pm	2100	10½	190	180'	Clear	
12:00	2100	10½	"	180'	"	
8/27/77						
1:00 am	2100	10½	190	180'	Clear	
2:00	2100	10½	"	180'	"	
3:00	2100	10½	"	180'	"	
4:00	2100	10½	"	180'	"	
5:00	2100	10½	"	180'	"	
6:00	2100	10½	"	180'	"	
7:00	2800	24	284	Dropping	"	
7:15	2800	22	272	235'	"	
7:30	2800	22½	"	245'	"	58°
8:00	2800	22	"	250'	"	
9:00	2800	21½	"	250'	"	
10:00	2800	21	"	250'	"	
11:00	2800	21	"	255'	"	
12:00	2800	21	"	255'	"	
1:00 pm	2800	21	"	255'	"	
1:50	2800	24	284	258'	"	

Application No. 6-8476
Permit No.

RECOVERY RATE

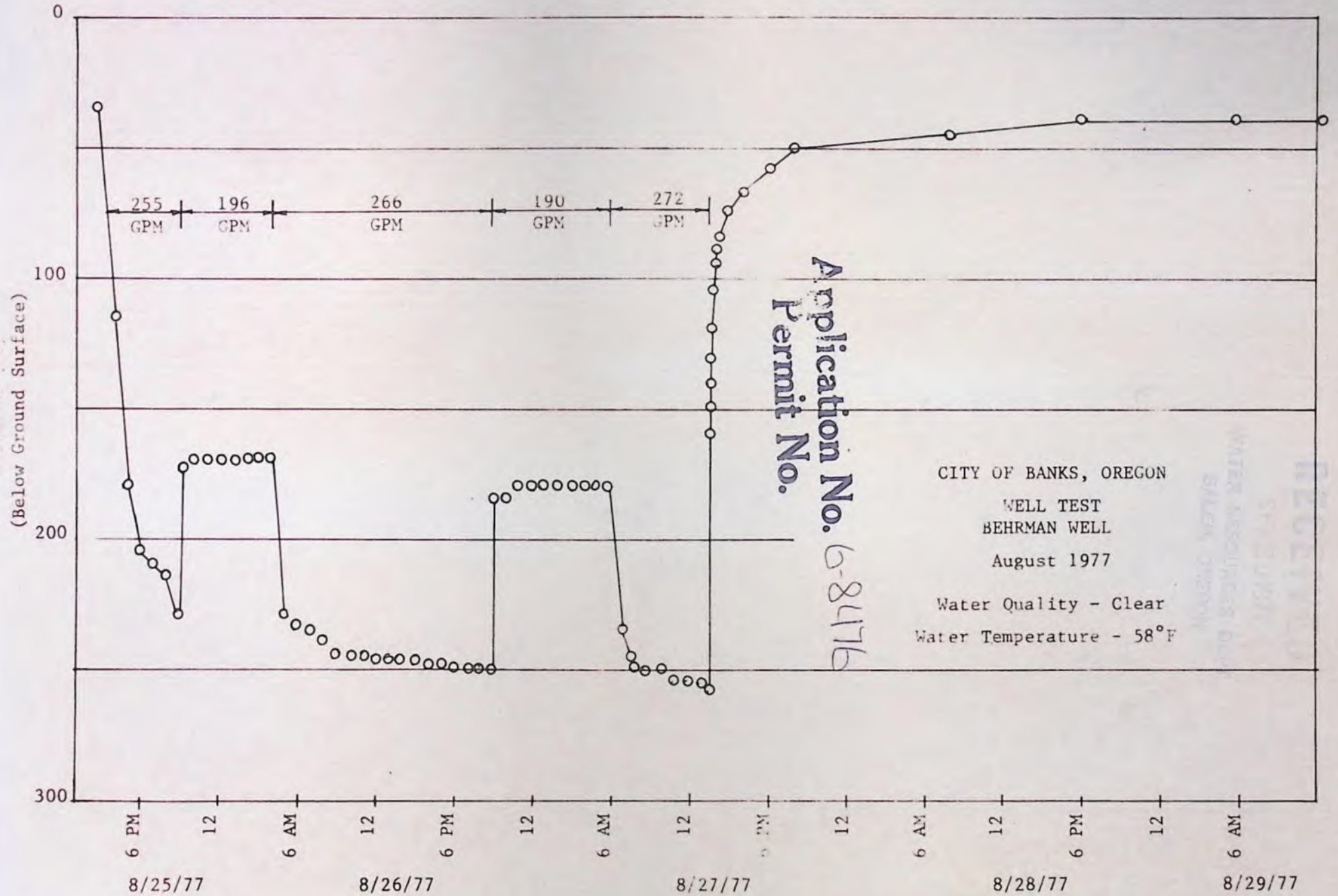
Starting Static 34'

August 27, 1977

Time	Elapsed Time	Water Level	
1:30	0 min.	259'	
1:33	3 "	160'	
1:34	4 "	150'	
1:35	5 "	140'	
1:36	6 "	130'	
1:40	10 "	120'	
1:46		108'	
1:50		105'	
2:01		95'	
2:08		91'	
2:22		85'	
2:32		79'	
3:01		76'	
4:00		67'	
6:00		58'	
12:00		50'	
8/28/77			
8:00 a.m.		45'	
6:00 p.m.		39'	
8/28/77			
6:00 a.m.		39'	
1:00 p.m.		39'	capped

Application No. G-8476
Permit No.

KLEIN CONSULTING ENGINEERS
1928 Council Street
Forest Grove, Oregon 97116



RECEIVED
SEP 30 1977
WATER RESOURCES DEPT
SALEM, OREGON

Lab # 27635

Well outlet
Sample Point

B.I' Ross
Collected By

Date Collected
8 /26/77
MO. DAY YR.

Time Collected
1 /00 A.M. P.M.
HRS. MIN

Remarks: initial well test - City of Banks - New Well - Banks Rd

Certified Laboratory No:

Mail To: Public Health Laboratory, Oregon State Health Division
P.O. Box 275, Portland, Oregon 97207

YES ☐ NO ☒
Chlorinated

Free Chlorine Residual:

TYPE OF SAMPLE
ROUTINE ☐ SPECIAL ☒
SAMPLE ☐
LAB NO.

REVIEWED
/ /
MO. DAY YR.

34 Washington Co. Health
150 N 1st St
Hillsboro, Oregon

WATER BACTERIOLOGICAL EXAMINATION

10-10-76

FOR LABORATORY USE ONLY

DATE RECEIVED — LAB. NO.					
VOL. ML	10	10	10	10	10
24 HOURS	—	—	—	—	—
48 HOURS	—	—	—	—	—
CONFIRMATION					
VOL. ML					
24 HOURS					
48 HOURS					
CONFIRMATION					

POS 0 NEG 5 CHECKED BY

MPN

DATE REPORTED 8/29/77 MO DAY YR

SAMPLE DOES ☒ DOES NOT ☐
CONFORM TO APHA STANDARDS

Application No. 6-8476
Permit No.

CITY OF BANKS, OREGON

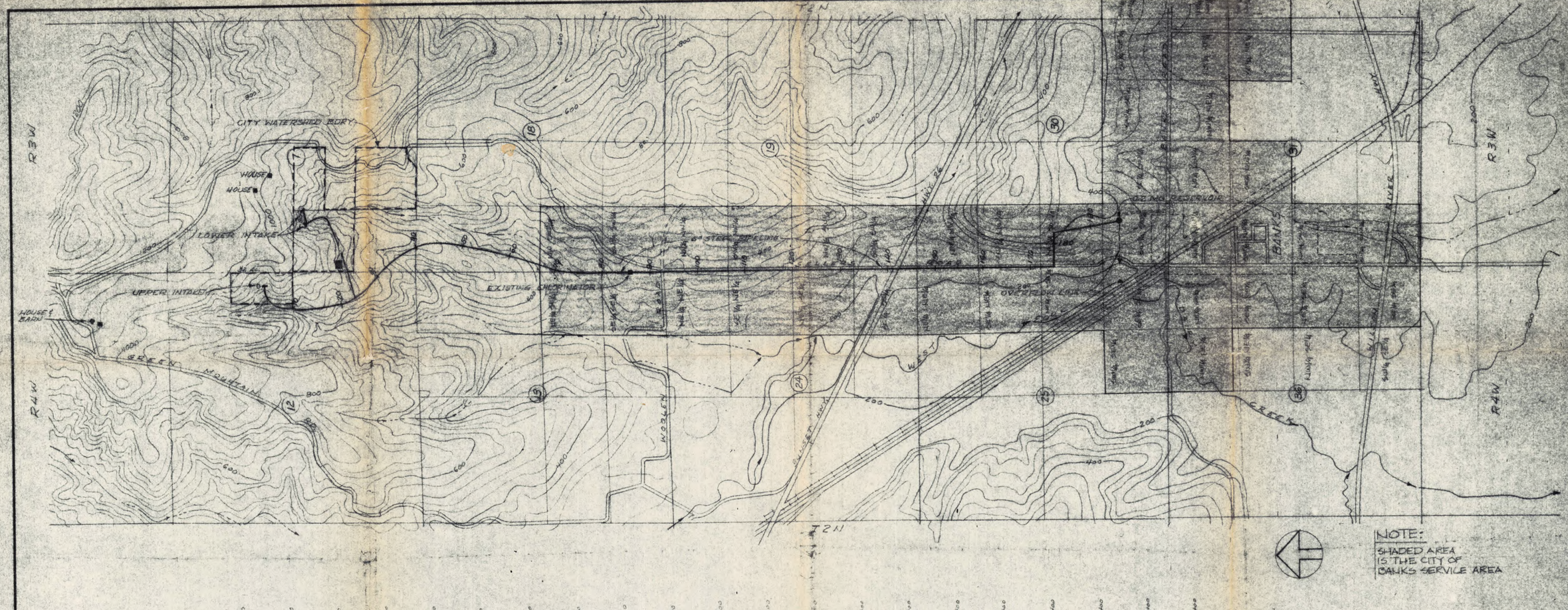
Chemical Analysis of Water Supply

LOCATION	Behrman Well		Upper Spring		Distribution System		EPA Standard	
DATE	August 26, 1977		July 25, 1968		December 11, 1962		Maximum	
Color	5		--		3		15	
Turbidity	0.25	J.T.U.	<1.0	J.T.U.	6	J.T.U.	5	J.T.U.
Total Solids	191	mg/1	85	mg/1	75	mg/1	500	mg/1
Volatile Solids	17	mg/1	49	mg/1	59	mg/1		
CO_2			2.3	mg/1	1.9	mg/1		
pH	7.6	mg/1	7.6	mg/1	7.5	mg/1		
Alkalinity	122	mg/1	37.0	mg/1	29.0	mg/1		
Hardness ($CaCO_3$)	86	mg/1	34.1	mg/1	32.9	mg/1		
Calcium	18.3	mg/1	8.6	mg/1	7.4	mg/1		
Magnesium	9.8	mg/1	3.1	mg/1	3.5	mg/1		
Iron	0.4	mg/1	0.04	mg/1	0.37	mg/1		
Manganese	<0.02	mg/1	<0.01	mg/1	<0.01	mg/1		
Arsenic	<0.005	mg/1	<0.005	mg/1	<0.005	mg/1		
Conductivity			94		75			
Chloride	5	mg/1	3.2	mg/1	6.5	mg/1	250	mg/1
Sodium	15.3	mg/1	2.0	mg/1	5.1	mg/1		
Potassium	3.8	mg/1	0.9	mg/1	1.9	mg/1		
Flouride	0.15	mg/1	0.10	mg/1	0.19	mg/1	1.8	mg/1
Phosphate			0.09	mg/1	0.06	mg/1		
Sulfate	<1	mg/1	2.4	mg/1	1.0	mg/1	250	mg/1
Silicon	60	mg/1	44.2	mg/1	28.0	mg/1		
Aluminum			<0.01	mg/1	<0.05	mg/1		
Ammonia Nitrogen			0.14	mg/1	0.08	mg/1		
Nitrate Nitrogen	<0.03	mg/1	<0.01	mg/1	0.08	mg/1	10	mg/1
Nitrite Nitrogen	<0.02	mg/1	<0.01	mg/1	0.12	mg/1		

Application No. G-8176
Permit No.

RECEIVED
SEP 29 1977
WATER RESOURCES DEPT.
SALEM, OREGON

Application No. G 8816
Permit No. G 7593



WATER RIGHTS

Certificate No. 5353
- Priority Date - October 3, 1928
- Source - Springs
- Location - SE¼ NE¼, Sec. 12, T2N, R4W, W.M.
- Quantity - 0.42 CFS.

PROPERTY RIGHTS

Location	Deed Bk. & Pg.	Date	Area
E½ of SE¼ NE¼, 12, T2N, R4W	158/448	8/2/1935	20 Ac.
NW¼ SW¼, 7, T2N, R3W	264/147	7/15/1946	40 Ac.
N½ of NE¼, SW¼, 7, T2N, R3W	264/147	7/15/1946	20 Ac.
SE¼ of SW¼, 7, T2N, R3W	264/145	8/16/1946	40 Ac.
Less part of SE¼ SW¼, 7	388/190	10/11/1962	- 32 Ac. ±
		Watershed ownership	116.8 Ac. ±
Reservoir Site			
SW¼ of 30, T2N, R3W (125'x125')	132/841	1/12/1926	0.36 Ac. (Est.)

DATE	NO.	REVISION	BY	DESIGNED AMK	APPROVED
				DRAWN	SCALE HOR. 1"=1000' VERT. 1"=100'
				CHECKED	DATE OCT. 1974
					FILE

KLEIN CONSULTING ENGINEERS
CIVIL ENGINEERS · PLANNERS
FOREST GROVE, OREGON

CITY OF BANKS, ORE.
WATER SUPPLY DEVELOPMENT

PLAN AND PROFILE
WATER SUPPLY SYSTEM

SHEET

Application No. G 7593
Permit No.

NORTH

RESERVOIR No. 2

EXISTING 0.2 MG.

PROPOSED PIPELINE (8")

EXISTING 10" PIPELINE TO CITY

POINT OF DIVERSION

BANKS ROAD

60'

½ CORNER

AERTS RD.

BANKS CITY LIMITS

BURLINGTON NORTHERN R.R.

SOUTHERN PACIFIC R.R.

WOODMEN AVE.

SUNSET AVE.

MARKET ST.

DEPOT ST.

PARK ST.

WILKES ST.

MAIN ST.

HWY. 47

WASHINGTON AVE.

ROSE AVE.

PACIFIC AVE.

HIGHWAY

WILKESBORO ROAD

SELLERS RD.

STATE HIGHWAY 47

CEDAR CANYON ROAD

WILSON RIVER

29 30 31 32 T2N WM

6 5 T1N WM

36 31 T2N R3W WM

1 6 T1N R3W WM

NOTE:
SHADED AREA IS THE CITY OF BANKS SERVICE AREA

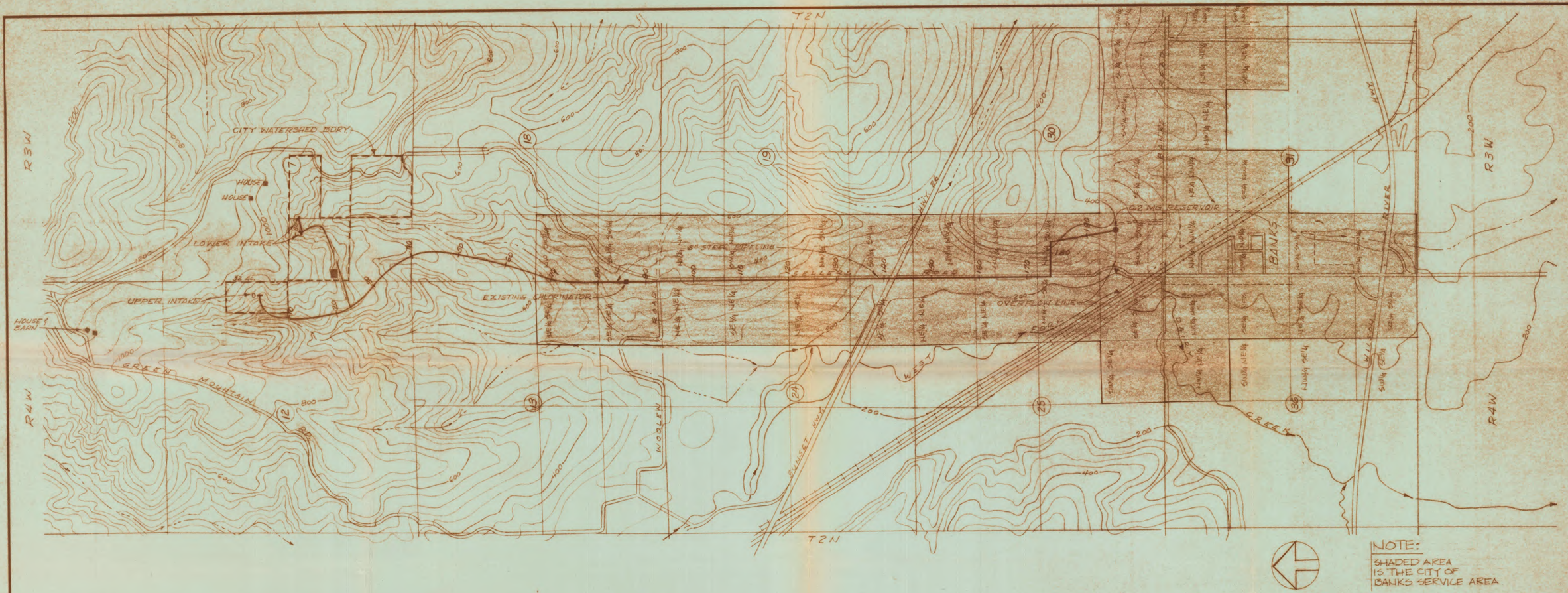
DATE	NO.	REVISION	BY	DESIGNED	APPROVED
				DRAWN JCN	SCALE 1"=400' DATE
				CHECKED	FILE 7018

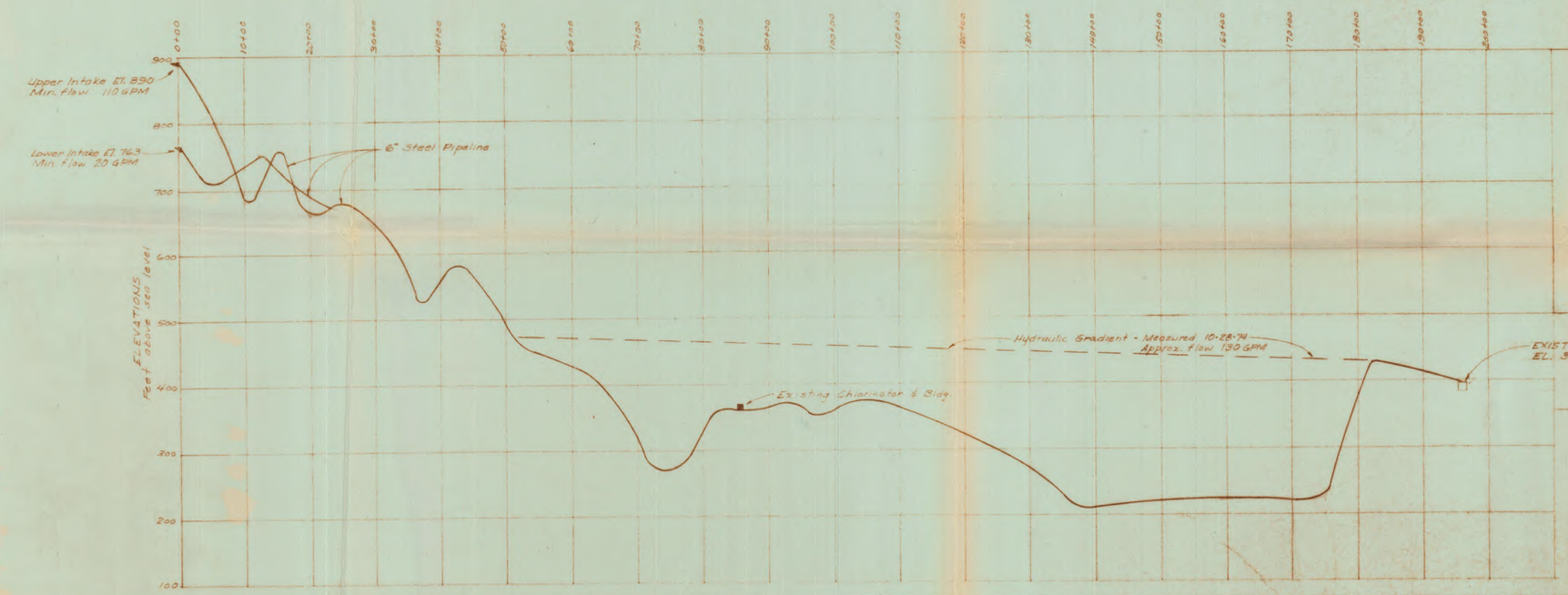
KLEIN CONSULTING ENGINEERS
CIVIL ENGINEERS · PLANNERS
FOREST GROVE, OREGON

WATER RIGHT MAP
TO ACCOMPANY AN APPLICATION FOR
CITY OF BANKS, OREGON
IN SECTIONS 29, 30, 31 & 32, T2N, R3W. WM. AND
SECTIONS 25 & 36, T2N, R4W, WM.
WASHINGTON COUNTY, OREGON

SHEET

Application No. 68476
Permit No. G 7593





WATER RIGHTS

Certificate No. 5353

Priority Date	-	October 3, 1923
Source	-	Springs
Location	-	SE¼ NE¼, Sect. 12, T2N, R4W, W.M.
Quantity	-	0.42 CFS.

PROPERTY RIGHTS

Location	Deed Bk. & Pg.	Date	Area
E½ of SE¼ NE¼, 12, T2N, R4W	158/448	6/6/1935	20 Ac.
NW¼ SW¼, 7, T2N, R3W.	264/147	7/15/1946	40 Ac.
N½ of NE¼, SW¼, 7, T2N, R3W.	264/147	7/15/1946	20 Ac.
SE¼ of SW¼, 7, T2N, R3W	244/145	8/15/1946	40 Ac.
Less part of SE¼ SW¼, 7	388/190	10/11/1956	- 8.2 Ac. ±
		Watersheet ownership	116.8 Ac. ±
Reservoir Site			
SW¼ of 30, T2N, R3W (125'×125')	132/241	1/12/1926	0.36 Ac. (Acc.)

RECEIVED
SEP 20 1977
WATER RESOURCES DEPT
SALEM, OREGON

DATE	NO.	REVISION	BY

DESIGNED	AMK
DRAWN	
CHECKED	
APPROVED	
SCALE	HOR: 1"=1000' VERT: 1"=100'
DATE	OCT. 1974
FILE	

KLEIN CONSULTING ENGINEERS
CIVIL ENGINEERS · PLANNERS
FOREST GROVE, OREGON

CITY OF BANKS, ORE.
WATER SUPPLY DEVELOPMENT

PLAN AND PROFILE
WATER SUPPLY SYSTEM

SHEET

Application No. G-8476
Permit No. G 7593

NORTH

RESERVOIR 0.2 MG.

EXISTING

PROPOSED PIPELINE (8")

EXISTING 10" PIPELINE TO CITY

BANKS ROAD

360'

¼ CORNER

POINT OF DIVERSION

AERTS RD.

BANKS CITY LIMITS

BURLINGTON NORTHERN R.R.

SOUTHERN PACIFIC R.R.

WOODMEN AVE.

PARK ST.

MARKET ST.

DEPOT ST.

SUNSET AVE.

WILKES ST.

WASHINGTON AVE.

ROSE AVE.

PACIFIC AVE.

HIGHWAY

WILKESBORO ROAD

SELLERS RD.

MAIN ST.

HWY. 47.

STATE HIGHWAY 47

CEDAR CANYON ROAD

WILSON RIVER

T2N WM
T1N WM
R4W WM
R3W WM

RECEIVED
SEP 26 1977
WATER RESOURCES DEPT
SALEM, OREGON

NOTE:
SHADED AREA IS THE CITY OF BANKS SERVICE AREA

DATE	NO.	REVISION	BY

DESIGNED
DRAWN JGN
CHECKED
APPROVED
SCALE 1"=400'
DATE 9-26-77
FILE 702-8

KLEIN CONSULTING ENGINEERS
CIVIL ENGINEERS • PLANNERS
FOREST GROVE, OREGON

WATER RIGHT MAP
TO ACCOMPANY AN APPLICATION FOR
CITY OF BANKS, OREGON
IN SECTIONS 29,30,31 & 32, T2N, R3W. WM. AND
SECTIONS 25 & 36, T2N, R4W, WM.
WASHINGTON COUNTY, OREGON

SHEET