Vault

City of Brookings
MEETING AGENDA

CITY COUNCIL

Monday, August 8, 2011, 7:00pm
City Hall Council Chambers, 898 Elk Drive, Brookings, OR 97415

The City Council will meet in **Executive Session at 6:30pm** in the City Manager's office, under the authority of ORS 192.660(2)(h), "to consult with counsel concerning the legal rights and duties of a public body with regard to current litigation or litigation likely to be filed," and under ORS 192.660 (2)(e), "to conduct deliberations with persons designated by the governing body to negotiate real property transactions."

A. Call to Order

B. Pledge of Allegiance

C. Roll Call

D. Oral Requests and Communications from the audience

1. Public Comments – 5 minute limit per person.*

E. Staff Reports

1. Authorize the City Manager to execute a lot line adjustment application for a 152.7 foot strip of land adjacent to 1005 Parkview Drive. [Planning, pg. 5]
   a. Parkview Subdivision Plat [pg. 6]
   b. Assessor's Map [pg. 7]
2. Authorize City Engineer to review Tribble/Orenco proposal, prepare letter report, and meet with City Council at a workshop, at a cost not to exceed $2,200, contingent upon Tribble agreeing to pay the aforementioned fee. [City Manager, pg. 8]
   a. North Bank Chetco River Road Wastewater Feasibility Analysis [Separate attachment]
   b. STEP Collection System for North Bank Chetco River Road Developments [Separate attachment]
   c. Letter dated July 6, 2011, from Ron Tribble [pg. 10]
   d. Letter dated March 1, 2011, to Ron Tribble [pg. 12]
   e. Task Order #33 [pg. 14]

F. Ordinances/Resolutions/Final Orders

1. Adopt resolution approving purchase of 230 King Street and authorizing the Mayor to sign the Purchase and Sale Agreement. [City Manager, pg. 16]
   a. Resolution 11-R-969 [pg. 18]
   b. Purchase and Sale Agreement. [pg. 19]

G. Consent Calendar

1. Approve Council minutes for:
   a. June 29, 2011 [pg. 46]
   b. July 18, 2011 [pg. 50]
   c. July 25, 2011 [pg. 51]

2. Authorize the Mayor to execute the Employment Agreement with Gary Milliman for services of City Manager. [pg. 53]
    a. Employment Agreement [pg. 54]
3. Authorize the City Manager to sign temporary easements for the Vista Ridge Waterline Improvement project. [pg. 58]
4. Accept July 2011 Vouchers in the amount of $391,380.91. [pg. 59]

H. Remarks from Mayor and Councilors

I. Adjournment

*Obtain Public Comment Forms and view the agenda and packet information on-line at www.brookings.or.us, at City Hall and at the local library. Return completed Public Comment Forms to the City Recorder before the start of meeting or during regular business hours.

All public meetings are held in accessible locations. Auxiliary aids will be provided upon request with advance notification. Please contact 469-1102 if you have any questions regarding this notice.

August 2011

August 2011

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September 2011

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	Monday	Tuesday	Wednesday	Thursday	Friday
Aug 1 - 5	**Aug 1** 11:00am 12:00pm CC - VIPS 4:00pm 6:00pm CC - Council Wkshp 7:00pm 10:00pm FH-FireTrng	**2** 7:00pm 10:00pm CC-Planning Comm	**3** 2:00pm 3:00pm CC- Site Plan 7:00pm 9:00pm FH-PoliceResrvs	**4** 3:00pm 4:00pm CC - Staff	**5**
Aug 8 - 12	**8** 7:00pm 10:00pm FH-FireTrng 7:00pm 9:30pm CC-Council	**9**	**10** 10:00am 11:00am FH-BRFD 10:00am 12:00pm CC- Site Plan 12:00pm 1:00pm CC - Stout Park	**11** 9:00am 10:30am CC-Crm Stoppers 1:00pm 2:00pm CC - Court	**12**
Aug 15 - 19	**15** 11:00am 12:00pm CC-VIPS 7:00pm 10:00pm FH-FireTrng	**16**	**17** 10:00am 12:00pm CC- Site Plan	**18**	**19**
Aug 22 - 26	**22** 7:00pm 9:00pm CC-Council 7:00pm 10:00pm FH-FireTrng	**23**	**24** 10:00am 12:00pm CC- Site Plan 12:00pm 1:00pm CC - Stout Park	**25** 7:00pm 9:00pm CC-Parks & Rec	**26**
Aug 29 - Sep 2	**29** 7:00pm 10:00pm FH-FireTrng	**30**	**31** 10:00am 12:00pm CC- Site Plan	**Sep 1**	**2**

P3

September 2011

September 2011

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October 2011

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	Monday	Tuesday	Wednesday	Thursday	Friday
Aug 29 - Sep 2	**Aug 29**	**30**	**31**	**Sep 1** 3:00pm 4:00pm CC - Staff	**2**
Sep 5 - 9	**5** 8:00am 5:00pm LABOR DAY - Closed 11:00am 12:00pm CC - VIPS 7:00pm 10:00pm FH-FireTrng	**6** 4:00pm 6:00pm CC - Council Wkshp 7:00pm 10:00pm CC-Planning Comm	**7** 10:00am 12:00pm CC- Site Plan 7:00pm 9:00pm FH-PoliceResrvs	**8** 9:00am 10:30am CC-Crm Stoppers 1:00pm 2:00pm CC - Court 3:00pm 5:00pm CC-URAC (Tentative)	**9**
Sep 12 - 16	**12** 7:00pm 10:00pm FH-FireTrng 7:00pm 9:30pm CC-Council	**13**	**14** 10:00am 11:00am FH-BRFD 10:00am 12:00pm CC- Site Plan 12:00pm 1:00pm CC - Stout Park 5:00pm 7:00pm CC - Victims Impact (Starts at 6pm)	**15**	**16**
Sep 19 - 23	**19** 11:00am 12:00pm CC-VIPS 7:00pm 10:00pm FH-FireTrng	**20**	**21** 10:00am 12:00pm CC- Site Plan	**22** 7:00pm 9:00pm CC-Parks & Rec	**23**
Sep 26 - 30	**26** 7:00pm 9:00pm CC-Council 7:00pm 10:00pm FH-FireTrng	**27**	**28** 10:00am 12:00pm CC- Site Plan 12:00pm 1:00pm CC - Stout Park	**29**	**30**

CITY OF BROOKINGS

COUNCIL AGENDA REPORT

Meeting Date: August 8, 2011

Originating Dept: Planning

Donna Colby-Hanks
Signature (submitted by)

City Manager Approval

Subject: Authorization for application for approximately 4,976 square feet of Parkview Drive to be lot line adjusted to 1005 Parkview Drive.

Recommended Motion: A motion to authorize the City Manager to execute a lot line adjustment application for a 152.7' long strip adjacent to 1005 Parkview Drive.

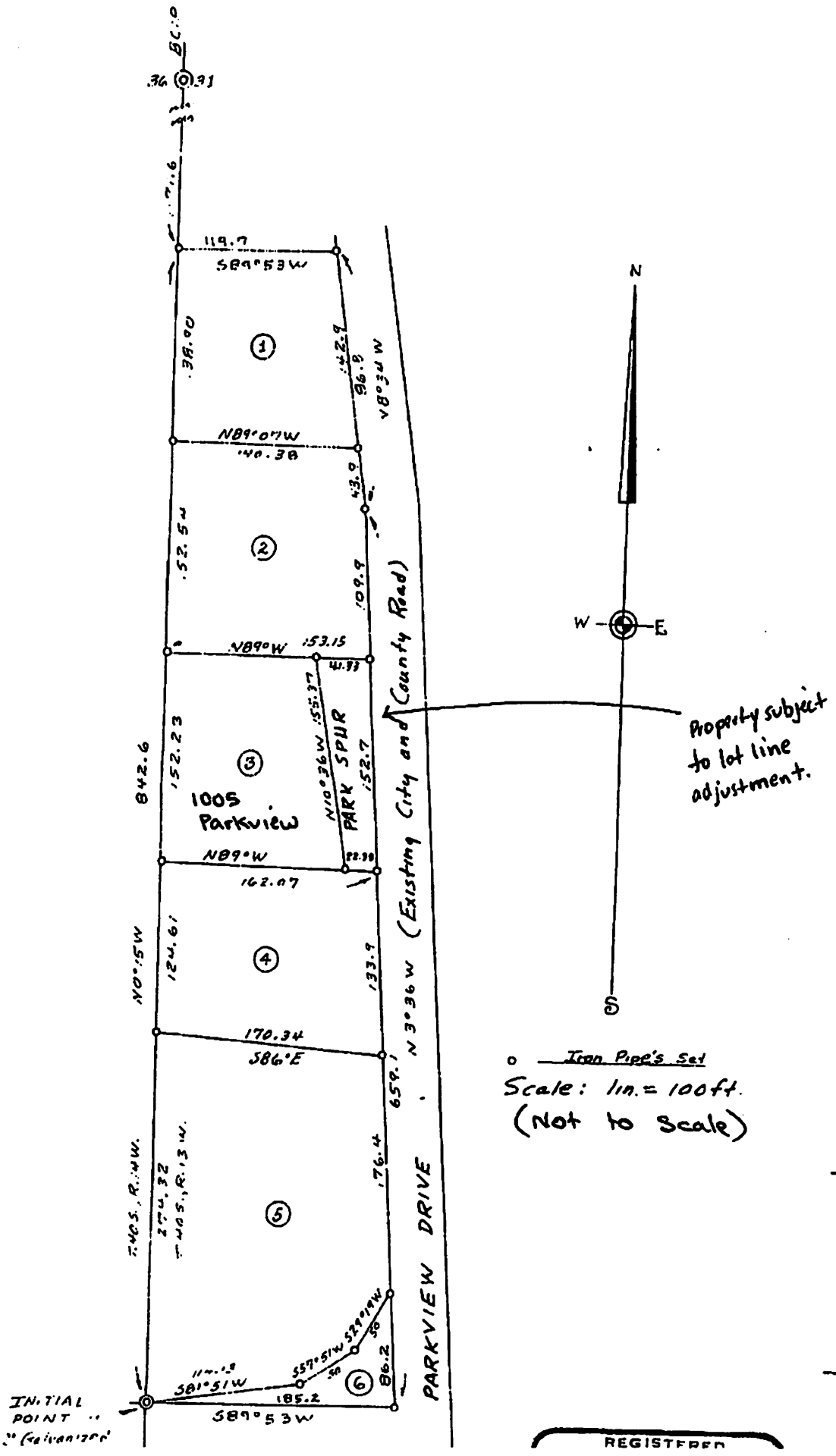
Financial Impact: None.

Background/Discussion: Staff was contacted by the property owner of 1005 Parkview Drive with a request for the City to allow an application for a lot line adjustment for a strip of Parkview Drive labeled Park Spur on Parkview Drive Subdivision Plat. This area has since been incorporated into the right-of-way of Parkview Drive creating an irregular right-of-way in this area. The property owner wishes to construct a shop on his property but has run into problems because of the setback requirements. Staff reviewed this proposal and recommends allowing a lot line adjustment application to straighten Parkview Drive's right-of-way and allow the property owner's shop project to move forward. The subject area of the right-of-way would be abandoned to the adjacent property owner.

Policy Considerations: This lot line adjustment application request is in accordance with previous similar actions.

Attachment(s):

A –Copy of original plat of Parkview Drive Subdivision.
B – Current assessor's map of the area.



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County of Coos
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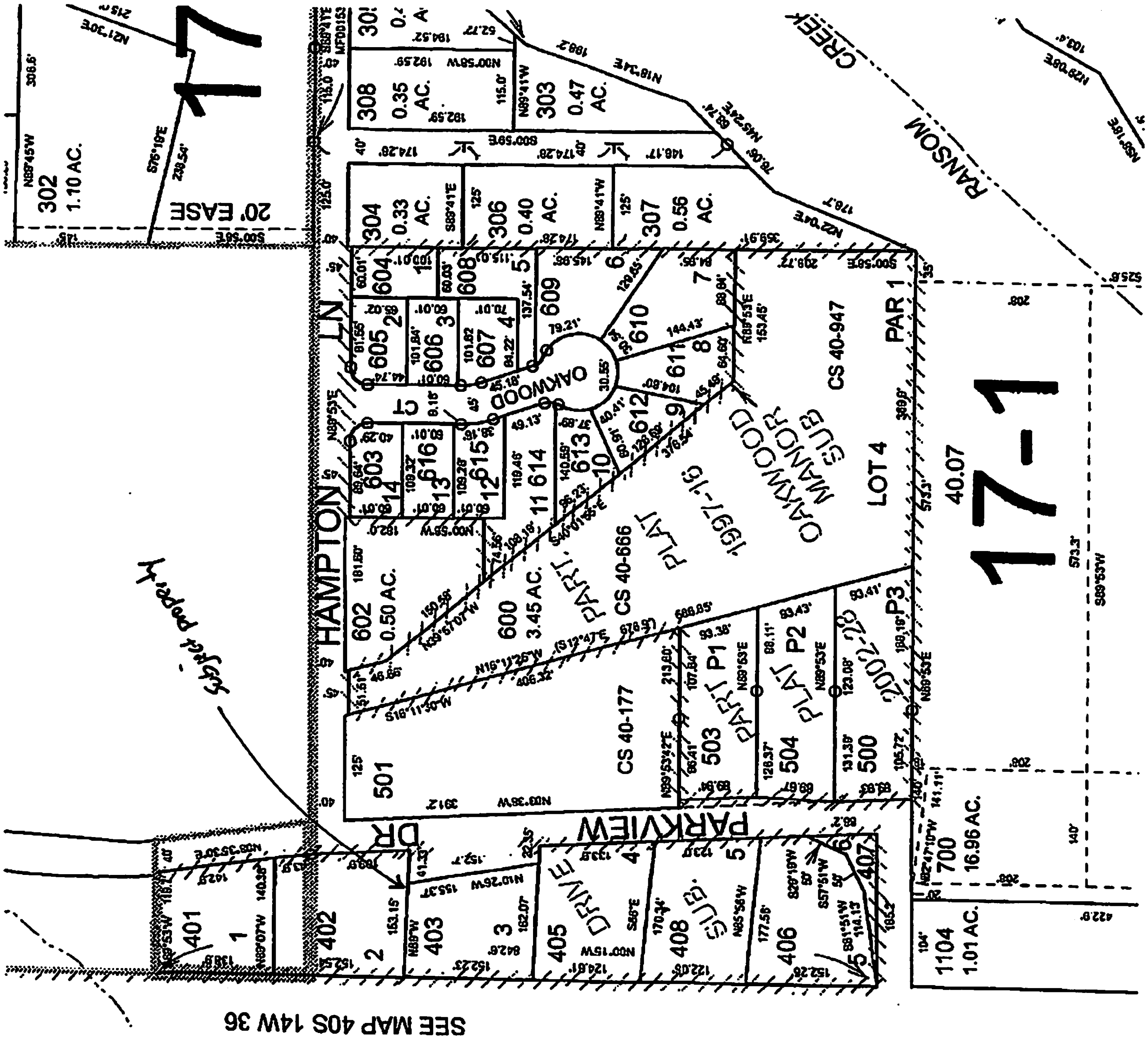
REGISTERED


17
17-1
HAMPTON LN
OAKWOOD CT
PARKVIEW DR
RANSOM CREEK
OAKWOOD MANOR SUB
PLAT 1997-16
PART PLAT 2002-20
DRIVE IN SUB.
CS 40-947
CS 40-666
CS 40-177
PAR 1
LOT 4
40.07
20' EASE
302 1.10 AC.
303 0.47 AC.
304 0.33 AC.
306 0.40 AC.
307 0.56 AC.
308 0.35 AC.
600 3.45 AC.
602 0.50 AC.
700 16.96 AC.
1104 1.01 AC.
SEE MAP 40S 14W 36

CITY OF BROOKINGS
COUNCIL AGENDA REPORT

Meeting Date: August 8, 2011

Originating Dept: City Manager

Signature (submitted by)

City Manager Approval

Subject: Task Order for Evaluation of Alternative Sewer System

Recommended Motion:
Authorize the City Engineer to review Tribble/Orenco proposal, prepare letter report, and meet with City Council at a workshop, at a cost not to exceed $2,200, contingent upon Tribble agreeing to pay the aforementioned fee.

Financial Impact:
$2,200 for additional engineering review.

Background/Discussion:
At its meeting of July 12, 2010 the City Council authorized an expenditure of $12,000 for the City Engineer (The Dyer Partnership) to develop a sewer service plan for properties within the Urban Growth Boundary (UGB) along North Bank Chetco River Road. The purpose of this study was to determine the ultimate infrastructure needed to serve this area of the UGB, which is not included in the Wastewater Master Plan, and to provide information to property owner Ron Tribble on the improvements that would be required to connect his property to the sewer collection system.

The engineering report was completed in November, 2010. The report has been reviewed at several meetings with Tribble, his partner, and three other property owners along North Bank Chetco River Road.

Tribble has now proposed an alternative system, known as the "STEP system" for the collection of wastewater. Tribble has requested that the City advise as to whether this alternative system would be acceptable to the City. Staff has reviewed the proposal, but engineering review is also needed. Authorizing this type of sub-system within the City's sewer collection system could have many impacts on future development beyond the Tribble property and sewer system operating costs. Tribble states that the STEP system would be more cost-effective for the developer, and that installing a traditional system as outline in the Dyer report is cost prohibitive. The Dyer Partnership has provided a Task Order that would authorize them to review the proposal and provide the City with a report and recommendations. The cost of this additional engineering work is $2,200. The Dyer Partnership has experience with STEP systems.

Tribble is requesting that the City respond to their proposal for an alternative sewer collection system prior to submitting an annexation application. The City has fulfilled its pre-application obligation to provide information on what would be required to connect to the City's sewer system. Staff recommends that any further work on this proposal be contingent upon Tribble agreeing to pay the engineering review fees.

Attachment(s):

a. North Bank Chetco River Road Wastewater Feasibility Analysis
b. STEP Collection System for the North Bank Chetco River Road Developments
c. Letter dated July 6, 2011, from Ron Tribble
d. Letter dated March 1, 2011 to Ron Tribble
e. Task Order 33

6 July, 2011

To: Gary Milliman; City Manager
City of Brookings

From: Ron Tribble; Mahar/Tribble LLC

RE: Alternative Sewer Study for North Bank Chetco River Road

In early April, members of the North Bank Land Owners Group (NBLOG) met at the Brookings City Hall with Gary Milliman, City Manager, regarding looking at an alternative to the sewer plan for the North Bank Chetco River Road (NBCRR) that came from the study done by Dyer & Assocs. for the City of Brookings. Also attending this meeting were people from Dyer & Assocs. and Orenco Systems. The discussion centered on using STEP and effluent sewer technologies for this area as opposed to the conventional gravity collection and lift stations, cost differences between the two approaches, questions concerning the viability of the technology and other related topics.

At the conclusion of this meeting, Gary Milliman indicated that he would like to see a proposal from the NBLOG for doing the sewer project using the alternative approach. NBLOG has contracted with Orenco Systems of Sutherlin Oregon to produce this study, a copy of which you should find accompanying this letter. Orenco Systems has put together a solution for connection to the City of Brookings public sewer system which is acceptable and affordable to the NBLOG.

During the course of preparing this study, I was involved in a meeting with Roy Page, City of Brooking wastewater plant operator, and David Lepre from Orenco Systems at the City's Waste Water Treatment Plant. We had a very thorough discussion covering the Orenco STEP and effluent sewer technologies. Careful consideration was given in this study to all Mr. Pages concerns and I believe you will find that the concerns of the City Manager have been adequately covered as well. Should the study not cover everything you need, we will gladly provide any additional information you request. It is our desire to work together with the City of Brookings on this matter.

The costs involved with the gravity system with lift stations in the Dyer Report will not allow expansion as NBLOG unanimously voted against it and simply can not afford to proceed any further. We believe we have an excellent alternative to the Dyer & Assocs. plan for the NBCRR sewer project using the STEP and effluent sewer technology and I believe you will find Orenco has developed an economical very effective system with a long proven track record. The members of NBLOG will work with the City of Brookings to implement this system if approved.

STEP and effluent sewer systems have been used in numerous Oregon Communities for nearly 30 years, not to mention countless communities across the nation, and these systems operate under guidelines from Oregon DEQ. Some of the significant benefits we see for both parties of this sewer extension include:

- The areas adjacent to North Bank Chetco River Road (NBCRR) that can be serviced are within the Urban Growth Boundary and implementation of the STEP and effluent sewer system would allow removal of large septic system drain fields in close proximity to the Chetco River. This certainly is a very positive move that would be supported by many state agencies.
- It can provide an increase in the tax base due to area growth.
- Service fees can be collected for the system to cover costs, and connection costs can be charged as part of the system development fees.
- For the NBLOG, it will allow us a way to develop our properties in a more affordable manner. This can allow us to actually lower costs to potential buyers as the unit cost is far less on infrastructure improvements.

Following review of this study by the City of Brookings, I would appreciate hearing from you regarding your impressions of the STEP and effluent sewer approach as well as to discuss how we should proceed from here.

We greatly appreciate the work the City of Brookings has done in working with the members of NBLOG; Mahar/Tribble LLC, Chetco River Resorts, Riverside RV and Tidewater Contractors.

Sincerely,

Mr. Ron Tribble (Cell 541 430-3455; E-mail rontribble@charter.net)

City of Brookings

898 Elk Drive, Brookings, OR 97415
(541) 469-1100 Fax (541) 469-3650 TTL (800) 735-1232
gmilliman@brookings.or.us

GARY MILLIMAN
City Manager
Credentialed City Manager
International City Management Association

Ron Tribble
736 Hemlock Lane
Roseburg, OR 97471

March 1, 2011

Dear Ron,

I have reviewed the information provided concerning the Orenco STEP systems with our public works and engineering staff. I also spoke with Eric Lanning at Orenco.

First, we have confirmed with Jonathan Gasik, Senior Environmental Engineer with the Oregon Department of Environmental Quality, that the City would be responsible for the operation and maintenance of all tanks, pumps and common force mains.

According to our City Engineer, Steve Major, he worked with the City of Elkton in the installation of their STEP system 25 years ago. In that instance, the City is responsible for all maintenance, including tanks and pumps. Major reports that his firm, The Dyer Partnership, has designed STEP systems for the City of Lakeside, Town of South Prairie and Union Gap Sanitary District, and that in every instance DEQ required the government entity to be responsible for the maintenance of the pumps and tanks. Major also reports that, approximately eight months ago, DEQ required the City of Sutherlin to assume maintenance responsibilities for the homeowners STEP system that surrounds the Sutherlin golf course, and that the Bunker Hill Sanitary District has assumed responsibility for maintenance of approximately 40 tanks installed by the developer in that community.

According to Lanning, Orenco also contracts to perform the maintenance and operation for STEP systems that they install. It is my understanding that, while Orenco performs the maintenance, the ultimate responsibility for the integrity of the system rests with the public agency. There may be some instances from early in the history of STEP systems or out of state where the systems are maintained by homeowners associations, but this is not the current practice authorized by DEQ.

The Dyer Partnership also advises that the STEP systems in which they have been involved were installed due to environmental conditions at the development site, such as

high water tables. They are not familiar with installations that have been made for economic reasons.
Steve Major also advises that the scope of work for the North Bank Chetco River Road sewer line could be downsized to accommodate just your development or your project and the two RV/park model communities. There could be a construction scenario which would involve the installation of pumping facilities that could be expandable as future development occurs. At this point, the City has paid for the development of information with respect to the preferred system to serve a larger area of the North Bank Chetco River Road. We would be willing to consider more limited system improvements to serve your development, or your development and your immediate willing neighbors. However, we believe that the responsibility for appropriately sizing the system and presenting an alternative for the City's consideration now rests with you.

As you also suggested, I contacted Winston City Administrator David Vandermarch concerning the project you mentioned in that City. Vandermarch informed me that the project you mentioned involved the formation of a Local Improvement District. He said that the total cost of improvements funded through the LID was $406,000, and that many of affected property owners chose to immediately pay their respective shares totaling $240,000. The balance was financed through a local bank and property owners are making payments at 5.1 per cent interest; the City did not issue bonds, but initially used its own reserve funds to finance the LID. They are now looking at refinancing. Brookings also has a LID vehicle available as a mechanism securing infrastructure financing.

I am willing to pursue any lead that would assist in securing financing for this project. I have also contacted Larry Kosmont, President, Kosmont Companies, with whom I have worked in securing funding and development agreements in connection with a variety of infrastructure projects over the years. Mr. Kosmont is based in Los Angeles, and I would be willing to arrange a conference call with him. Visit his website at www.kosmont.com

As indicated previously, I will continue to make efforts to meet with the owners of the "Tidewater property" to discuss their future plans for their property and assess their willingness to participate in a sewer system project.

Respectfully,

Gary Milliman
City Manager

Cc: Dianne Morris, Planning Director
Steve Major, City Engineer
Richard Christensen, Technical Services Superintendent

TASK ORDER 33
City of Brookings
Review of Tribble/Orenco Proposal

SCOPE OF WORK: The City requests that the Dyer Partnership review the proposal submitted to the City of Brookings titled "STEP Collection System for the North Bank Chetco River Road Development 2011" by Orenco, Inc. as an alternative to the system alternatives proposed in the report titled "North Bank Chetco River Road Wastewater Feasibility Study" November 2010, by the Dyer Partnership.

FOUNDATION: Orenco believes that they can provide the level of wastewater service discussed and developed in the Dyer Study for the area under consideration using their STEP system at a lower cost than conventional gravity sewer, force main and pump station systems as developed in the Dyer Report.

SCOPE OF ENGINEERING SERVICES

The City needs engineering services for review of the Orenco report. The Dyer Partnership will review the Orenco STEP system report and compare its assumptions and design basis with the previous Dyer study. If determined to be feasible, the alternative costs of the Orenco alternatives will be examined in terms of life cycle costs. A review letter will be provided to the City of Brookings critiquing the system, discussing its "pros" and "cons", estimating the complete life cycle costs of the Orenco alternatives and finally providing a recommendation regarding acceptance of the Orenco alternatives for development in the study area.

Schedule (anticipated)

Letter report provided to City 3 weeks after authorization to proceed.

Proposed Fee

Services will be performed and billed on a time and materials basis, in accordance with the conditions of the Professional Services Agreement and fee listed herein. The not to exceed fees is listed as follows:

Review of Orenco Report (Proj. Man. 3 hrs @ $110)	$330
Review of Dyer Report (Proj. Man. 1 hr @ $110)	$110
Life cycle cost - Orenco Alter. (Proj Man. 4 hr @ $110)	$440
Letter Report Prep (Proj. Man. 4 hr @ $110 & Clerical 1 hr @ $49)	$489
Review by Principle (Proj. Principal 1 hr @ $120)	$120
Trip to discuss w/ City/Orenco (Proj. Principal 6 hrs @ $120)	$720
Total Not to Exceed Fee	$2,200

No work will be started until City has provided written authorization.

PAYMENT METHOD: Monthly Billing

City of Brookings

_____
Gary Milliman, City Manager

Date:_____

The Dyer Partnership
Engineers & Planners, Inc.

_____
Steve Major, P.E., President

Date:_____

CITY OF BROOKINGS

COUNCIL AGENDA REPORT

Meeting Date: August 8, 2011

Originating Dept: City Manager

Signature (submitted by)

City Manager Approval

Subject: Purchase and Sale Agreement 230 King Street

Recommended Motion: Motion to adopt Resolution 11-R-969, a Resolution of the City of Brookings Approving the Purchase of 230 King Street and Authorizing the Mayor to Sign the Purchase and Sale Agreement.

Financial Impact:
The City will utilize a portion of the proceeds from the sale of its property on Wharf Street (net proceeds of $605,000; an additional $80,000 is due from the Urban Renewal Agency) to purchase the property on King Street for $575,000. The City will also assume ongoing responsibility for maintenance of Parkview Drive within the City Limits, and will receive lease revenue at the King Street property from U.S. Cellular.

Background/Discussion:
This is an agreement with Curry County for the purchase of the former Curry County Public Works Department maintenance yard (County Yard) by the City for use as a City Public Works Department maintenance yard (City Yard).

The City sold the City Yard through the Urban Renewal Agency to Bi Mart. The City Public Works Department has occupied the County Yard since vacating the City Yard. The City Yard was comprised of one 1.9 acre parcel and there were no structures located on the property. The County Yard is comprised of three parcels totaling approximately 1.84 acres, upon which two buildings are located. The appraised value of the County Yard properties was $575,000 in November, 2010.

The County leased a portion of the County Yard to United States Cellular Wireless Communications in 1999. The lease term is 20 years and currently generates annual lease revenue of $6,416, and is scheduled for a CPI increase in 2012. The area leased to U.S. Cellular does not impair the City's ability to utilize the property for its City Yard purposes. The Agreement includes assignment of this lease to the City.

The County has agreed to sell the property to the City for the amount of the appraised value and an additional consideration involving the disposition of Parkview Drive. Under the terms of the Agreement, the City would assume responsibility for maintaining that portion of Parkview Drive that is within the City Limits. When this area was annexed into the City in 2002, the City declined to accept the public street into the City maintained street system because it did not meet City street standards. Parkview Drive was improved by the County in 2005 and County records

now indicate an annual maintenance cost averaging at about $3,700. This would also resolve the unusual circumstance of having a County maintained road within the City Limits.

The City has budgeted $8,000 for improvements to one of the buildings on the subject property to enable the City to utilize the building for storage. The City currently rents several storage units at $9,216 per year, and this cost would be eliminated by relocating the storage to the new City Yard. The City would also be able to house some of its maintenance equipment under roof at the new City Yard. The bulk of the Public Works Department operation could continue to be housed at the Wastewater Treatment Plant.

Attachment(s):

a. Resolution 11-R-969
b. Purchase and Sale Agreement for Real Property 230 King Street, Brookings, Oregon

CITY OF BROOKINGS
STATE OF OREGON

RESOLUTION 11-R-969

A RESOLUTION OF THE CITY OF BROOKINGS APPROVING THE PURCHASE OF 230 KING STREET AND AUTHORIZING THE MAYOR TO SIGN THE PURCHASE AND SALE AGREEMENT.

WHEREAS, the City of Brookings is currently using 230 King Street as its public works yard;

WHEREAS, the City of Brookings is in need of a stable location for its public works yard;

WHEREAS, 230 King Street is currently owned by Curry County; and

WHEREAS, Curry County desires to sell to City and City desires to purchase from Curry County that real property known as 230 King Street for the price of $575,000 plus additional consideration as set forth in the purchase and sale agreement;

NOW, THEREFORE, BE IT RESOLVED by the City Council of the City of Brookings that:

1. The attached Purchase and Sale Agreement with Curry County is hereby approved; and

2. The Mayor is hereby authorized to sign said Purchase and Sale Agreement, as well as all other documents contemplated by the transaction, on behalf of the City of Brookings.

Passed by the City Council _____, 2011 and made effective the same date.

Attest:

_____
Mayor Larry Anderson

_____
City Recorder Joyce Heffington

PURCHASE AND SALE AGREEMENT FOR REAL PROPERTY
230 KING STREET, BROOKINGS, OREGON

THIS AGREEMENT is entered into on August ____, 2011 ("Effective Date") by and between the City of Brookings, an Oregon municipal corporation ("BUYER"), and Curry County, a political subdivision of the State of Oregon ("SELLER"). SELLER and BUYER are referred to jointly in this Agreement as "Parties" and individually as a "Party."

AGREEMENT

SELLER agrees to sell and convey, and BUYER agrees to purchase, AS-IS, the real property situated in the City of Brookings, Curry County, Oregon, commonly referred to as 230 King Street, and more particularly described in Exhibit A, which is attached to this Agreement and incorporated by this reference ("the Property"), on the following terms and conditions.

1. GENERAL TERMS OF CONVEYANCE

1.01 Conveyance of Property. Upon satisfaction of the Conditions Precedent to Closing in Section 4 hereof, SELLER will convey the Property AS-IS to BUYER pursuant to a statutory warranty deed in substantially the same form as the sample deed in Exhibit B, attached to this Agreement. The closing will occur in an escrow closing at the office of Curry County Title (the "Escrow Agent") in Brookings, Oregon.

1.02 Purchase Price. The total purchase price of the Property is Five Hundred Seventy-Five Thousand Dollars ($575,000.00), payable by BUYER to SELLER.

1.03 Additional Consideration. As additional consideration for the Property, BUYER will accept that portion of Parkview Drive that is within the city limits into the city maintained street system. BUYER will work in good faith with SELLER to complete the transfer in accordance with applicable Oregon law. SELLER will bear the costs associated with the transfer.

1.04 Assignment of Lease. As part of this Agreement, SELLER will assign the ground lease with U.S. Cellular dated October 15, 1999, as amended, on the Property to BUYER. The lease is attached hereto as Exhibit C. The assignment of the lease will automatically take place upon the recordation of the deed.

1.05 Parties to Bear Own Expenses. Except as otherwise specifically provided in this Agreement, BUYER and SELLER will pay their own costs, respective attorney's fees and expenses incurred or to be incurred by them in negotiating and preparing this Agreement and in carrying out the transactions contemplated hereby.

2. TITLE REVIEW

2.01 Within fifteen (15) days after the Effective Date, SELLER will deliver to BUYER a preliminary title report with respect to the Property, and copies of all exception documents (the "Title Report"). Within ten (10) days following its receipt of the Title Report, BUYER may object to SELLER in writing to any exceptions to title. Within ten (10) days of BUYER's

written notice to SELLER described in the preceding sentence, SELLER must notify BUYER in writing of its intention to remove or not remove the objectionable exceptions to title prior to closing. If SELLER refuses to remove any such objected to exceptions, BUYER may terminate this Agreement or proceed to close subject to same. Any exceptions to which BUYER does not timely object in writing or otherwise accepts at closing are the "Permitted Exceptions."

2.02 SELLER covenants and agrees that it will not further encumber the Property (other than Permitted Exceptions). BUYER may, at any time prior to closing, obtain an updated Title Report. Within ten (10) days following its receipt of the updated Title Report, BUYER may object to SELLER in writing to any exceptions to title. Within five (5) days of BUYER's written notice to SELLER described in the preceding sentence, SELLER must notify BUYER in writing of its intention to remove or not remove the objectionable exceptions to title prior to closing. If SELLER refuses to remove any such objected to exceptions, BUYER may terminate this Agreement or proceed to close subject to same. Any exceptions to which BUYER does not timely object in writing or otherwise accepts at closing are the "Final Permitted Exceptions."

3. TITLE INSURANCE & CLOSING COSTS.

3.01 Title Insurance. BUYER will pay the premium for an ALTA Owner's Policy of Title Insurance, issued by Escrow Agent, covering the Property insuring BUYER in the amount of the Purchase Price, all free and clear of encumbrances except the standard exceptions and the Final Permitted Exceptions.

3.02 Closing Costs. The costs for recording the deed will be paid by BUYER. SELLER and BUYER will each pay one-half of the escrow fees charged by Escrow Agent. BUYER will be obligated to pay all property taxes from and after the closing date. Any assessments, if any, on the Property will be prorated as of the closing date. All other closing costs, if any, will be shared equally by the Parties.

4. CONDITIONS PRECEDENT TO CLOSING.

4.01 Conditions. BUYER and SELLER are not obligated to close unless the following conditions have been satisfied to the reasonable satisfaction of the benefited Party. The Party benefited by a particular condition may not unreasonably withhold, condition or delay acknowledgment that the conditions have been satisfied. The Parties must act diligently and in good faith to satisfy conditions over which they have control or influence.

4.02 BUYER's Conditions. BUYER is not obligated to purchase the Property until to BUYER's satisfaction:

(a) SELLER is able to transfer title to the Property to BUYER in accordance with and subject to the provisions of Section 1.01;

(b) BUYER is able to secure a title insurance policy;

(c) No litigation is pending which prevents the SELLER or BUYER from performing their respective obligations under this Agreement; and

(d) BUYER has inspected and approved the Property for the use contemplated by BUYER. BUYER may take soil samples, obtain environmental surveys, and obtain engineering studies of the Property.

4.03 SELLER's Conditions. SELLER is not obligated to sell the Property until to SELLER's satisfaction:

(a) BUYER has full authority to enter into and perform the obligations of this Agreement;

(b) No litigation is pending which prevents SELLER or BUYER from performing their respective obligations under this Agreement; and

(c) BUYER has performed its obligations under this Agreement.

4.04 Election Upon Non-Occurrence of Conditions. Except as provided below, if any condition in Section 4.02 or 4.03 is not fulfilled to the satisfaction of the benefited Party or Parties on the date scheduled for closing, then such benefited Party or Parties may elect to:

(a) Terminate this Agreement, which termination will be effective immediately upon notice to the other Party; or

(b) Waive, in writing, the benefit of the condition precedent to its obligation to perform under this Agreement, and proceed in accordance with the terms hereof.

5. RIGHTS, DUTIES, REPRESENTATIONS AND WARRANTIES

5.01 Rights and Duties of BUYER. BUYER has the following rights and duties. BUYER or BUYER's agents are granted the right, at any time and from time to time after the opening of the escrow and for twenty (20) days thereafter, to conduct tests or investigations on the Property. The acts shall be conducted at the sole cost and expense of BUYER and any damage resulting therefrom shall be the responsibility of BUYER. BUYER shall indemnify and hold SELLER harmless from any costs or liability resulting from the acts.

5.02 BUYER representations and warranties.

BUYER represents that:

(a) BUYER has full power and authority to enter into and perform this Agreement in accordance with its terms, and BUYER has taken all requisite action in connection with the execution of this Agreement and the transactions contemplated hereby.

(b) BUYER enters into this Agreement without reliance upon any oral representation of any kind by SELLER, its employees, agents or consultants regarding any aspect of the Property.

5.03 SELLER representations and warranties.

SELLER represents that:

(a) SELLER owns the Property, free and clear of all liens, licenses, claims, encumbrances, easements, encroachments on the Property from adjacent properties, encroachments by improvements on the Property onto adjacent properties, and rights of way of any nature, not disclosed by the public record.

(b) To the best of SELLER's knowledge, there is no litigation, action, suit, or any condemnation, environmental, zoning, or other government proceeding pending or threatened, which may affect the Property or SELLER's ability to perform its obligations under this Agreement.

(c) SELLER has full power and authority to enter into and perform this Agreement in accordance with its terms, and all requisite action has been taken by SELLER in connection with the execution of this Agreement and the transactions contemplated hereby.

5.04 Survival of Warranties. All warranties, covenants, and other obligations in this Agreement shall survive delivery of the deed.

6. ESCROW & CLOSING

6.01 Opening of Escrow. Within five (5) business days of the Effective Date of this Agreement, BUYER will open an escrow account with the Escrow Agent. BUYER and SELLER shall deposit with the Escrow Agent all instruments, documents, and other items identified in the escrow instructions or reasonably required by the Escrow Agent to close the sale on the closing date specified below.

6.02 Earnest Money. At the time of opening the escrow account, BUYER will deposit the sum of One Thousand Dollars ($1,000.00) as earnest money (the "Escrowed Funds") with Escrow Agent, which agrees to hold the sum in escrow for disposition according to this Section 6.02.

(a) Upon closing, the Escrowed Funds will be credited toward the purchase price.

(b) If closing does not occur for any reason other than the default by BUYER as provided in Section 7 below, then the Escrowed Funds will be delivered by Escrow Agent to BUYER.

(c) If closing does not occur because of the default by BUYER as provided in Section 7 below, then the Escrowed Funds will be delivered by Escrow Agent to SELLER.

6.03 Closing of Escrow. BUYER and SELLER will accomplish the purchase and sale of the Property (the "Closing") at such a place and time as may be mutually agreed upon.

(a) Obligations of Seller at Closing. SELLER will retain possession of the Property until Closing and will deliver possession to BUYER upon Closing.

(b) Delivery of Title. At the closing escrow, the Escrow Agent will deliver to BUYER a copy of the recorded statutory warranty deed.

(c) Obligations of Buyer at Closing. On the Closing date, BUYER will deliver to Escrow Agent the purchase price and its share of the closing costs as described in Section 3.02.

6.04 Closing Date. Escrow shall close within 60 days of its opening unless said closing date is extended by mutual agreement of the parties.

7. DEFAULT

7.01 Consequences of BUYER'S Default. If BUYER defaults on any material term of this Agreement before the sale of the Property to BUYER closes, SELLER's sole and exclusive remedy shall be to terminate this Agreement by written notice to BUYER and to receive from the Escrow Agent the Escrowed Funds as liquidated damages. The Parties agree that the extent of monetary damages incurred by SELLER in the case of BUYER's default prior to the Closing is difficult to ascertain. Therefore, as liquidated damages, and not as a penalty, SELLER will retain the Escrowed Funds.

7.02 Consequences of SELLER's Default. If any condition set forth in this Agreement is not satisfied, or if BUYER notifies SELLER in writing before the close of escrow of SELLER's breach of any of SELLER's warranties set forth in this Agreement, then BUYER may cancel the escrow, terminate this Agreement, and recover the Escrowed Funds less BUYER's share of escrow charges. BUYER shall exercise this power to terminate by providing written notice to SELLER and the Escrow Agent within five (5) days of the discovery of the failure or breach. The exercise of this power shall not waive any other rights BUYER may have against SELLER for breach of this contract. SELLER shall instruct the Escrow Agent, in the escrow instructions, to refund to BUYER all money and instruments deposited in escrow by BUYER pursuant to this contract on failure of a condition or breach of a warranty and receipt of a termination notice. This instruction shall be irrevocable.

8. RISK OF LOSS

8.01 Before Close of Escrow. If damage, destruction, or condemnation occurs at any time before the close of escrow, without fault of BUYER, BUYER shall not have the right to terminate this contract, but shall be entitled to offset the cost of repair or replacement against the purchase price of the Property.

8.02 After Close of Escrow. If after SELLER transfers legal title to the Property to BUYER, all or any part of the Property is destroyed without fault of SELLER, or is taken by eminent domain by any person or entity, BUYER is not relieved from BUYER's obligation under this Agreement to pay the full price for the Property, nor is BUYER entitled to recover any portion of the price BUYER has paid.

9. GENERAL PROVISIONS

9.01 Notice. Any notice or communication under this Agreement by either Party to the other will be deemed given and delivered (a) seventy-two (72) hours after being deposited with the U.S. Postal Service, sent registered or certified, postage prepaid, or (b) when received if personally delivered, and:

(a) In the case of a notice or communication to BUYER, addressed as follows:

Gary Milliman, City Manager
City of Brookings
898 Elk Drive
Brookings, OR 97415

(b) In the case of a notice or communication to SELLER, addressed as follows:

Jeni Meyer, Assistant County Counsel for Curry County
P.O. Box 746
94235 Moore Street
Gold Beach, OR 97444

or addressed in such other way in respect to either Party as that Party may, from time to time, designate in writing and serve as provided in this Section. Notice given in any other manner will be effective upon receipt by the Party for whom the same is intended.

9.02 Waivers. No waiver by SELLER or BUYER of any provision of this Agreement or any breach thereof may be of any force or effect unless in writing; and no such waiver may be construed to be a continuing waiver.

9.03 Calculation of Time. All periods of time referred to herein include Saturdays, Sundays, and legal holidays in the State of Oregon, except that if the last day of any period falls on any Saturday, Sunday or legal holiday, the period will be extended to include the next day which is not a Saturday, Sunday or legal holiday.

9.04 Brokers. Each Party agrees to pay any commission or finder's fees that may be due on account of this transaction to any broker or finder employed by it and to indemnify the other Party against any claims for such commissions or fees.

9.05 Modifications. Any modifications to this Agreement must be made in writing and signed by both Parties.

9.06 Governing Law. This Agreement is governed by the laws of the State of Oregon.

9.07 Severability. If any clause, sentence or any other provision of the terms and conditions of this Agreement becomes illegal, null or void for any reason, the remaining provisions will remain in full force and effect to the fullest extent permitted by law.

9.08 Entire Agreement. This Agreement and the attachments hereto are the entire agreement between the Parties. There is no other oral or written agreement between the Parties with regard to this subject matter. The Parties are not entitled to rely on any prior oral or written representations made by either Party, implied or express, other than those contained in this Agreement.

9. 09 Time of the Essence. Time is of the essence in this Agreement and failure to comply with this provision constitutes a material breach of this Agreement.

Executed this ____ day of _____, 2011.

CITY OF BROOKINGS

_____
Larry Anderson, Mayor

ATTEST:

_____
Joyce Heffington, City Recorder

CURRY COUNTY

_____
George Rhodes, Chair

_____
David Itzen, Vice Chair

_____
Bill Waddle, Commissioner

EXHIBIT A: Property Description

PARCEL 1

That certain tract of land lying in the Southeast Quarter (SE 1/4) of the Southeast Quarter (SE 1/4) of Section Six (6), Township Forty-one (41) South, Range Thirteen (13) West, Willamette Meridian, City of Brookings, Curry County, Oregon, described as follows:

Beginning at a point as described in Book of Records 23, page 188, Official Records, Curry County, Oregon being 496.6 feet South and 127.1 feet East of the Southeast Corner of Block Six (6), Plat of the City of Brookings, Oregon;

Thence North 89° 41' West 222.2 feet to the East boundary of King Street;
Thence following the East boundary of King Street North 0° 03' East 80.2 feet;
Thence South 89° 42' 30" East 222.4 feet;
Thence South 00° 11' West 80.0 feet to the point of beginning.

Together with that certain tract of land lying in Section Six (6), Township Forty-one (41) South, Range Thirteen (13) West, Willamette Meridian, City of Brookings, Curry County, Oregon, described as follows:

Beginning at a point as described in Book of Records 43, pages 83 and 84, Official Records, Curry County, Oregon being 344.68 feet South and 154.35 feet West of the Southeast Corner of Block Six (6), City of Brookings, Plat No. 1;

Thence South 39° 46' East 92.55 feet;
Thence South 89° 42' East 222.4 feet;
Thence North 00° 11' East 115.97 feet to the Southwest boundary of Railroad Street;
Thence following the Southwesterly boundary of Railroad Street, North 71° 25' West 73.83 feet;
Thence South 00° 14' West 69.38 feet;
Thence North 89° 34' West 110 feet;
Thence North 89° 14' West (this bearing sometimes called North 69° 34' West) 101.72 feet, more or less, to the point of beginning.

PARCEL 2

A tract of land lying in the Southeast Quarter (SE 1/4) of the Southeast Quarter (SE 1/4) of Section Six (6), Township Forty-one (41) South, Range Thirteen (13) West, Willamette Meridian, City of Brookings, Curry County, Oregon:

Beginning at a point as described in Deed Volume 50, page 259, Official Records, Curry County, Oregon being North 580.43 feet and West 1099.80 feet from the Southeast Corner of said Section Six (6), said point being on the East line of King Street;

Thence following said Street line North 16° 16' East 206.25 feet;

Thence East 156.24 feet;
Thence South 16° 16' West 250.00 feet;
Thence North 73° 44' West 150.00 feet to the point of beginning.

PARCEL 3

A tract of land lying in the Southeast Quarter (SE 1/4) of the Southeast Quarter (SE 1/4) of Section Six (6), being also in Donation Land Claim Number Thirty-seven (37) in Township Forty-one (41) South, Range Thirteen (13) West of the Willamette Meridian, in Curry County, Oregon, described as follows:

Beginning at a point as described in Book of Records 38, page 209, Official Records, Curry County, Oregon being North 490.42 feet and West 969.80 feet from the Southeast Corner of said Section Six (6);

Thence North 73° 44' West 150.00 feet;
Thence North 16° 16' East 50.00 feet;
Thence South 73° 44' East 150.00 feet;
Thence South 16° 16' West 50.00 feet to the point of beginning.

EXHIBIT B: Sample Deed

After Recording Return to and
Tax Statements to be sent to:

City of Brookings
898 Elk Drive
Brookings, OR 97415

STATUTORY WARRANTY DEED

KNOW ALL PEOPLE, that the COUNTY OF CURRY, a political subdivision of the State of Oregon located at 94235 Moore Street, Gold Beach, Oregon 97444 ("Grantor"), does hereby convey and warrant to the CITY OF BROOKINGS, an Oregon municipal corporation ("Grantee"), and unto its successors and assigns, all the following described real property free of encumbrances except as specifically set forth herein, with the tenements, hereditaments, and appurtenances (herein called the "Property"), situated in the County of Curry and State of Oregon:

See Attachment 1 – Description of Real Property.

The conveyance is subject to the following: all easements, covenants, restrictions, conditions and encumbrances which may appear in the public record, including those shown on any recorded plat or survey.

The true consideration given for this conveyance is $575,000.00 and other value given.

BEFORE SIGNING OR ACCEPTING THIS INSTRUMENT, THE PERSON TRANSFERRING FEE TITLE SHOULD INQUIRE ABOUT THE PERSON'S RIGHTS, IF ANY, UNDER ORS 195.300, 195.301 AND 195.305 TO 195.336 AND SECTIONS 5 TO 11, CHAPTER 424, OREGON LAWS 2007, AND SECTIONS 2 TO 9 AND 17, CHAPTER 855, OREGON LAWS 2009. THIS INSTRUMENT DOES NOT ALLOW USE OF THE PROPERTY DESCRIBED IN THIS INSTRUMENT IN VIOLATION OF APPLICABLE LAND USE LAWS AND REGULATIONS. BEFORE SIGNING OR ACCEPTING THIS INSTRUMENT, THE PERSON ACQUIRING FEE TITLE TO THE PROPERTY SHOULD CHECK WITH THE APPROPRIATE CITY OR COUNTY PLANNING DEPARTMENT TO VERIFY THAT THE UNIT OF LAND BEING TRANSFERRED IS A LAWFULLY ESTABLISHED LOT OR PARCEL, AS DEFINED IN ORS 92.010 OR 215.010, TO VERIFY THE APPROVED USES OF THE LOT OR PARCEL, TO DETERMINE ANY LIMITS ON LAWSUITS AGAINST FARMING OR FOREST PRACTICES, AS DEFINED IN ORS 30.930, AND TO INQUIRE ABOUT THE RIGHTS OF NEIGHBORING PROPERTY OWNERS, IF ANY, UNDER ORS 195.300, 195.301 AND 195.305 TO 195.336 AND SECTIONS 5 TO 11, CHAPTER 424, OREGON LAWS 2007, AND SECTIONS 2 TO 9 AND 17, CHAPTER 855, OREGON LAWS 2009.

[SIGNATURES ON NEXT PAGE]

IN WITNESS WHEREOF, the County of Curry, a political subdivision of the State of Oregon, has caused this Deed to be executed this _____ day of _____2011.

By: CURRY COUNTY

_____
George Rhodes, Chair

_____
David Itzen, Vice Chair

_____
Bill Waddle, Commissioner

STATE OF OREGON)
) ss.
COUNTY OF CURRY)

This instrument was acknowledged before me on _____, 2011 by _____, Chair, _____, Vice Chair and _____, Commissioner of the Curry County Board of Commissioners.

_____
Notary Public for Oregon

Attachment 1 – Description of Real Property

PARCEL 1

That certain tract of land lying in the Southeast Quarter (SE 1/4) of the Southeast Quarter (SE 1/4) of Section Six (6), Township Forty-one (41) South, Range Thirteen (13) West, Willamette Meridian, City of Brookings, Curry County, Oregon, described as follows:

Beginning at a point as described in Book of Records 23, page 188, Official Records, Curry County, Oregon being 496.6 feet South and 127.1 feet East of the Southeast Corner of Block Six (6), Plat of the City of Brookings, Oregon;

Thence North 89° 41' West 222.2 feet to the East boundary of King Street;
Thence following the East boundary of King Street North 0° 03' East 80.2 feet;
Thence South 89° 42' 30" East 222.4 feet;
Thence South 00° 11' West 80.0 feet to the point of beginning.

Together with that certain tract of land lying in Section Six (6), Township Forty-one (41) South, Range Thirteen (13) West, Willamette Meridian, City of Brookings, Curry County, Oregon, described as follows:

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Thence following the Southwesterly boundary of Railroad Street, North 71° 25' West 73.83 feet;
Thence South 00° 14' West 69.38 feet;
Thence North 89° 34' West 110 feet;
Thence North 89° 14' West (this bearing sometimes called North 69° 34' West) 101.72 feet, more or less, to the point of beginning.

PARCEL 2

A tract of land lying in the Southeast Quarter (SE 1/4) of the Southeast Quarter (SE 1/4) of Section Six (6), Township Forty-one (41) South, Range Thirteen (13) West, Willamette Meridian, City of Brookings, Curry County, Oregon:

Beginning at a point as described in Deed Volume 50, page 259, Official Records, Curry County, Oregon being North 580.43 feet and West 1099.80 feet from the Southeast Corner of said Section Six (6), said point being on the East line of King Street;

Thence following said Street line North 16° 16' East 206.25 feet;

Thence East 156.24 feet;
Thence South 16° 16' West 250.00 feet;
Thence North 73° 44' West 150.00 feet to the point of beginning.

PARCEL 3

A tract of land lying in the Southeast Quarter (SE 1/4) of the Southeast Quarter (SE 1/4) of Section Six (6), being also in Donation Land Claim Number Thirty-seven (37) in Township Forty-one (41) South, Range Thirteen (13) West of the Willamette Meridian, in Curry County, Oregon, described as follows:

Beginning at a point as described in Book of Records 38, page 209, Official Records, Curry County, Oregon being North 490.42 feet and West 969.80 feet from the Southeast Corner of said Section Six (6);

Thence North 73° 44' West 150.00 feet;
Thence North 16° 16' East 50.00 feet;
Thence South 73° 44' East 150.00 feet;
Thence South 16° 16' West 50.00 feet to the point of beginning.

EXHIBIT C: Lease Agreement

RECEIVED
NOV - 1 1999
CURRY COUNTY CLERK

VOL# 1999 DOC# 6L2

#2355

10

GROUND LEASE

This Lease agreement is made and entered into this 15th day of October, 1999, by and between Curry County, 94235 Moore Street, P.O. Box 746, Gold Beach, Oregon 97444, hereinafter referred to as "Lessor", and USCOC of Oregon RSA #5, Inc., a Delaware corporation, doing business as *United States Cellular Wireless Communications*, Attention: Real Estate, 8410 West Bryn Mawr Avenue, Suite 700, Chicago, Illinois 60631 ("Lessee").

1. Demise of Leasehold Parcel. Lessor lets and demises unto Lessee, and Lessee receives and accepts from Lessor, the property legally described on the attached Exhibit "A" and "B" which are incorporated by reference.

2. Grant of Easement. Lessor will grant a utility easement to the local cooperative for electrical service to the leasehold property.

3. Grant of Additional Rights. To effect the purposes of this lease, Lessor grants to Lessee the following additional rights:

a) the right to improve an access road within the leasehold property, and

b) the right to place utility lines and related infrastructure within the Utilities Easement Parcel.

4. Use of the Premises. Lessee shall be entitled to use the Premises to construct, operate, modify as necessary, and maintain thereon a communications antenna tower (including aviation hazard lights when required), an access road, one or more equipment buildings, and a security fence, together with all necessary lines, anchors, connections, devices, and equipment for the transmission, reception, encryption, and translation of voice and data signals by means of radio frequency energy and landline carriage. The Premises shall not be used for any other purposes without the consent of Lessor. In its use of the property, Lessee shall conform to all applicable laws and regulations of any public authority affecting the Leasehold property, and shall correct at Lessee's own expense any failure of compliance created through Lessee's fault or by reason of Lessee's uses.

5. Term of Lease. This lease term shall commence on the date the Lessee sends notice to Lessor that the conditions precedent have been satisfied and shall expire twenty years later unless the lease is renewed or terminated in accordance with its provisions.

6. Option to Renew. Lessee shall have the option to renew this Lease for up to two

additional terms of five years each, upon a continuation of all the same provisions hereof, by giving written notice to Lessor of Lessee's exercise of this option at least sixty (60) days before the expiration of the term then present at the time of such notice.

7. Option to Terminate. Lessee shall have the unilateral right to terminate this Lease at any time by giving written notice to Lessor of Lessee's exercise of this option and paying Lessor the amount of $2,500.00 as an early termination fee.

8. Base Rent. Lessee shall pay Base Rent to Lessor in the amount of five thousand dollars ($5,000.00) per year, which shall be due on the commencement date of this lease and then regularly thereafter each year on the anniversary date of the first payment.

9. Adjusted Rent. On every five years' anniversary of the commencement date of the term of this Lease, and throughout the duration hereof as renewed and extended, the Base Rent shall be adjusted in proportion to the cumulative change in the latest published Consumer Price Index compared to the same index as historically recorded for the month and year in which the term of this Lease commenced. "Consumer Price Index" shall mean the Consumer Price Index for All Urban Consumers, All Items, U.S. City Average, 1982-84 = 100, (U.S. Department of Labor, Bureau of Labor Statistics). If the said Index ceases to be published, then a reasonably comparable index shall be used.

10. Possession of Premises. Lessee shall not be entitled to take possession of the Premises and commence work to construct the Improvements until Lessee makes the first payment of rent. Lessee shall, however, be permitted to enter upon the Premises to cause engineering studies to be made with respect thereto, including surveys, soil tests, radio wave propagation and field strength tests, and such other analyses and studies of the Premises as Lessee determines to be necessary or desirable without being deemed to have taken possession.

11. Utilities. Lessee shall solely and independently be responsible for all costs of providing utilities to the Premises, including the separate metering, billing, and payment of utility services consumed by Lessee's operations.

12. Property Taxes Lessee shall pay the personal property taxes levied against the Improvements and the real estate taxes levied against the land underlying the Leasehold Parcel. If the classification of the land for tax purposes changes as a result of Lessee's commercial use, then Lessee shall be responsible for increases attributable to such commercial use.

13. Repairs. Lessee shall be responsible for all repairs of the Improvements, and may at its own expense alter or modify the Improvements to suit its needs consistent with the intended use of the Premises.

14. Mutual Indemnification. Lessee shall indemnify and hold Lessor harmless from and

against any loss, damage, or injury caused by, or on behalf of, or through the fault of Lessee, or in any way resulting from Lessee's presence upon Lessor's lands. Lessor shall indemnify and hold Lessee harmless from and against any loss, damage, or injury caused by, or on behalf of, or through the fault of the Lessor. Nothing in this Article shall require a party to indemnify the other party against such other party's own willful or negligent misconduct.

15. Insurance. Lessee shall continuously maintain in full force and effect a policy of commercial general liability insurance with limits of One Million Dollars on an occurrence basis covering Lessee's work and operation upon Lessor's lands.

16. Liens.

(a) Except with respect to activities for which Lessor is responsible, Lessee shall pay as due all claims for work done on and for services rendered or material furnished to the leased premises and shall keep the premises free from any liens. If Lessee fails to pay any such claims or discharge any lien, Lessor may do so and collect the cost as additional rent. Any amount so added shall bear interest at the rate of 9% per annum from the date expended by Lessor and shall be payable on demand. Such action by Lessor shall not constitute a waiver of any right or remedy which Lessor may have on account of Lessee's default.

(b) Lessee may withhold payment of any claim in connection with a good-faith dispute over the obligation to pay, so long as Lessor's property interests are not jeopardized. If a lien is filed as a result of nonpayment, Lessee shall, within 10 days after knowledge of the filing, secure the discharge of the lien or deposit with Lessor cash or sufficient corporate surety bond or other surety satisfactory to Lessor in an amount sufficient to discharge the lien plus any costs, attorney fees, and other charges that could accrue as a result of a foreclosure or sale under the lien.

17. Default.

There shall be a default in each of the following instances:

(a) Default in Rent. Failure of Lessee to pay any rent or other charge within 10 days after written notice that it is due.

(b) Default in Other Covenants. Failure of Lessee to comply with any term or condition or fulfill any obligation of the lease (other than the payment of rent or other charges) within 20 days after written notice by Lessor specifying the nature of the default with reasonable particularity. If the default is of such nature that it cannot be completely remedied within the 20-day period, this provision shall be complied with if Lessee begins correction of the default within the 20-day period and thereafter proceeds with reasonable diligence and in good faith to effect the remedy as soon as practicable.

Page 3

18. Remedies in Default. In the event of a default the lease may be terminated at the option of Lessor by notice in writing to Lessee. If the lease is not terminated by election of Lessor or otherwise, Lessor shall be entitled to recover damages from Lessee for the default. If the lease is terminated, Lessee's liability to Lessor for damages shall survive such termination, and Lessor may reenter, take possession of the premises, and remove any persons or property by legal action or by self-help with the use of reasonable force and without liability for damages.

19. Assignment and Sublease. No part of the lease property may be assigned, mortgaged, or subleased, nor may a right of use of any portion of the property be conferred on any third person by any other means, without the prior written consent of Lessor. This provision shall apply to all transfers by operation of law. No consent in one instance shall prevent the provision from applying to a subsequent instance. Lessor shall consent to a transaction covered by this provision when withholding such consent would be unreasonable in the circumstances.

20. Execution of Other Instruments. Lessor agrees to execute, acknowledge, and deliver to Lessee other instruments respecting the Premises, as Lessee or Lessee's lender may reasonably request from time to time, provided that any such instruments are in furtherance of, and do not substantially expand, Lessee's rights and privileges herein established. Such instruments may include a memorandum of lease which may be recorded in the country land records. Lessor also agrees to reasonably cooperate with Lessee's efforts to obtain all private and public consents related to Lessee's use of the Premises, as long as Lessor is not expected to bear the financial burden of any such efforts.

21. Removal of Improvements. The improvements are agreed to be Lessee's personal property and shall never be considered fixtures to the real estate. Lessee shall at all times be authorized to remove the improvements from the Premises. Upon the expiration or earlier termination of this Lease, Lessee shall remove any above-ground improvements from the Premises. Lessee shall be entitled to abandon all footings, foundations, and other below-ground improvements in place.

22. Enjoyment of Premises. Lessee understands that the leasehold property is adjacent to a county road shop where such activities as the stockpiling of gravel and culvert disposal occur on a regular basis. Lessee has entered into this lease knowing and consenting to this arrangement of being located adjacent to the County shop. Within the parameters of ordinary work activity, Lessor covenants to Lessee that it will not intentionally disturb Lessee's enjoyment thereof so long as Lessee is not in default under this lease.

23. Entry for Inspection. Upon reasonable notice Lessor shall have the right to enter upon the leasehold property to determine Lessee's compliance with this lease.

24. Maintenance. Lessee shall maintain the leasehold property and all improvements in first class condition and repair throughout the term of the lease, ordinary wear and tear expected.

25. Reconstruction After Damage: Except as set forth below, if any building, antenna pole or tower, or other improvement in the Leasehold Parcel is damaged or destroyed by fire or any other cause at any time during the lease term, Lessee shall promptly repair the damage and restore the improvement; provided however, in the event any of the said improvements in the Leasehold Parcel are completely destroyed or so damaged by fire or other casualty covered by insurance as to render it unfit for use as a cellular communication's facility, and repair or restoration is not economically feasible, the Lessee may terminate this lease on notice of at least ten (10) days and no more than thirty (30) days. This notice shall be given within thirty (30) days after the date of such damage or destruction. If the lease shall so terminate, rent shall be apportioned to the date of termination.

26. Surrender. Upon expiration of the lease term or renewal term, Lessee shall surrender the Premises to Lessor in good condition.

27. Holdover. Failure by Lessee to vacate the leasehold property at the time specified in the lease shall not constitute a renewal or extension or give Lessee any additional rights in the premises. Upon such a holdover, Lessee shall defend and indemnify Lessor from all liability and expense resulting from the failure or delay of Lessee to timely surrender the leasehold.

28. Governing Law. This lease and the partys' rights under it shall be construed and regulated by the laws of the State of Oregon. Any legal action initiated pursuant to this lease shall be in the Circuit Court of Curry County, Oregon or a Federal Court in the State of Oregon.

29. Binding Effect. All of the covenants, conditions, and provisions of this lease shall inure to the benefit of and be binding upon the parties hereto and their respective successors and assigns.

30. Entire Agreement. This lease constitutes the entire agreement between the parties and supersedes any prior understandings or oral or written agreements between the parties respecting the within subject matter.

31. Modifications. This lease may not be modified, except in writing signed by the party against whom such modification is sought to be enforced.

32. Attorney's Fees. In any action of this lease at law or in equity, the prevailing party shall be entitled to recover the reasonable costs of its successful case, including reasonable attorney's fees and costs of appeal.

33. Subordination. Lessee agrees to subordinate this lease to any mortgage or trust deed which may hereafter be placed on the Premises, provided such mortgage or trust deed thereunder shall ensure to Lessee the right to possession of the Premises and other rights granted to Lessee herein so long as Lessee is not in default beyond any applicable grace or cure period, such assurance to be in form reasonably satisfactory to Lessee. If requested by

Lessee, Lessor agrees to use Lessor's best efforts to assist Lessee in obtaining from any holder of a security interest in the land underlying the Premises a non-disturbance agreement in form reasonably satisfactory to Lessee.

34. Conditions Precedent. This lease and Lessee's obligations hereunder, including the obligations to pay rent or damages, are expressly conditioned upon and subject to the following conditions being met March 1, 2000:

1) Lessee has a survey done of the requested leasehold interest at its expense.

2) Lessee must receive all necessary local, state, and federal governmental approvals relating to Lessee's intended use of the Premises. All land use appeals must be resolved in favor of USCOC;

3) Lessee's technical reports must establish to Lessee's exclusive satisfaction that the Premises are capable of being suitably engineered to accomplish Lessee's intended use of the Premises;

4) Lessee's title insurer must determine that Lessor owns good and clear marketable title to the land underlying the Premises, and that such title is free from encumbrances and restrictions which would interfere with Lessee's intended use of the Premises or would impair Lessee's ability to pledge the leasehold estate as collateral to secure debt financing; and

5) Written objections, if any, by local community residents must be resolved to the exclusive satisfaction of Lessee to ensure popular support of Lessee's operations.

Lessee shall notify Lessor in writing within 10 days of when the conditions precedent have been met. The first payment of rent is due upon the mailing of notice that the conditions have been met. If each and every one of the conditions are not met by March 1, 2000, this lease shall expire automatically.

35. Lessor's Option to Install Antenna . Lessor shall have the option to install an antenna on Lessee's communication antenna tower, subject to Lessor's non-interference of Lessee's operations.

IN WITNESS WHEREOF, the parties hereto bind themselves to this Ground Lease as of the day and year first above written.

LESSOR:

Curry County

Social Security # (or FEIN)
93-6000-2291

LESSEE:

USCOC of Oregon RSA #5, Inc.
a Delaware corporation

By: _____
Vice President

BOARD OF COMMISSIONERS

_____ 11-1-99
Lloyd Olds, Chairman

_____ 11-1-99
Cheryl Thorp, Vice Chair

_____ 11-1-99
Bill Roberts, Commissioner

Page 7

STATE OF Oregon)
)
COUNTY OF Curry)

I, the undersigned, a notary public in and for the State and County aforesaid, do hereby certify that Lloyd Olds; Cheryl Thorpe (and) Bill Roberts, known to me to be the same person(s) whose name(s) (is) (are) subscribed to the foregoing Ground Lease, appeared before me this day in person and (severally) acknowledged that (he) (she) (they) signed the said Lease as (his) (her) (their) free and voluntary act for the uses and purposes therein stated.

Given under my hand and seal this 1st day of November, 1999.

OFFICIAL SEAL
COLLEEN BAILEY
NOTARY PUBLIC-OREGON
COMMISSION NO. 051062
MY COMMISSION EXPIRES JAN. 21, 2001

Colleen Bailey
Notary Public

My commission expires 1/21/01

STATE OF Illinois)
)
COUNTY OF Cook)

I, the undersigned, a notary public in and for the State and County aforesaid, do hereby certify that Stephen Clark Vice President of USCOC of Oregon RSA #5, INC. known to me to be the same person whose name is subscribed to the foregoing Ground Lease, appeared before me this day in person and acknowledged that, pursuant to his authority, he signed the said Lease as his free and voluntary act on behalf of the named Lessee corporation, for the uses and purposes therein stated.

Given under my hand and seal this 13th day of October, 1999.

Murray J. Lewison
Notary Public

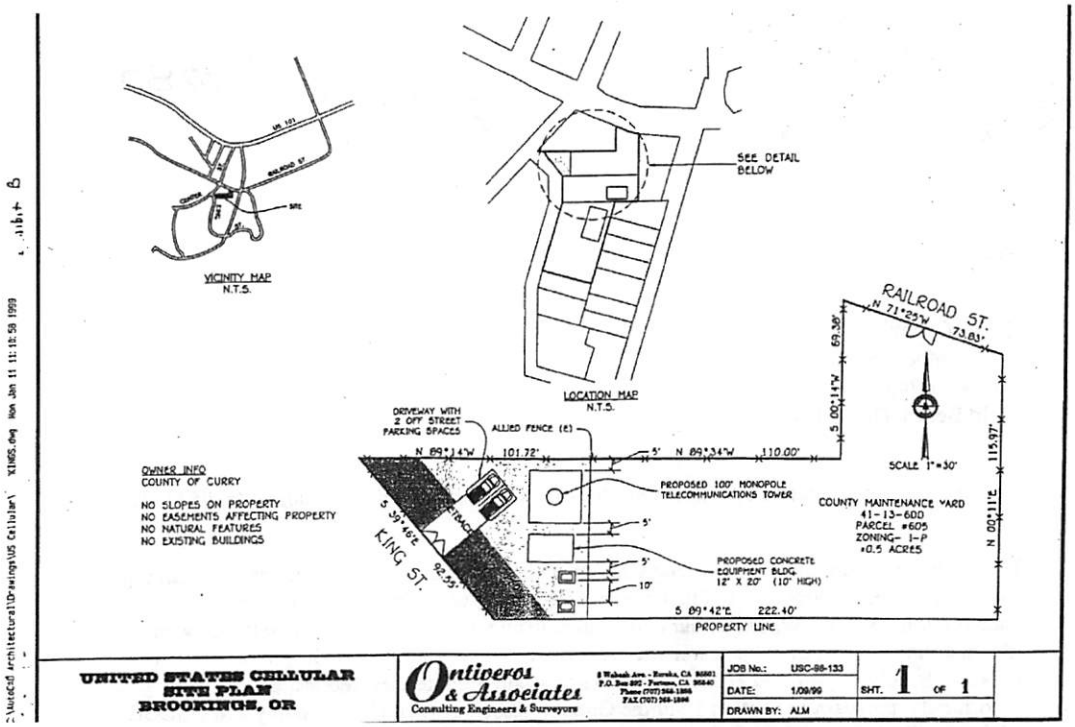
My commission expires _____

"OFFICIAL SEAL"
Murray J. Lewison
Notary Public, State of Illinois
My Commission Exp. 02/04/2002

EXHIBIT "A"

A portion of that certain tract of land lying in Section 6, Township 41 South, Range 13 W, (Curry County Assessors Parcel Number 605), Willamette Meridian, City of Brookings, Curry County, State of Oregon.

Approximate dimensions: approximately 102 feet by 72 feet, by 42 feet, by 93 feet.


VICINITY MAP
N.T.S.
SEE DETAIL BELOW
LOCATION MAP
N.T.S.
RAILROAD ST.
N 71°25'W 73.83'
69.38'
S 00°11'W
115.97'
N 00°11'E
SCALE 1"=30'
DRIVEWAY WITH 2 OFF STREET PARKING SPACES
ALLIED FENCE (E)
N 89°34'W 101.72'
5'
N 89°34'W 110.00'
OWNER INFO
COUNTY OF CURRY
NO SLOPES ON PROPERTY
NO EASEMENTS AFFECTING PROPERTY
NO NATURAL FEATURES
NO EXISTING BUILDINGS
PROPOSED 100' MONOPOLE TELECOMMUNICATIONS TOWER
COUNTY MAINTENANCE YARD
41-13-600
PARCEL #605
ZONING- I-P
±0.5 ACRES
5'
5'
10'
PROPOSED CONCRETE EQUIPMENT BLDG. 12' X 20' (10' HIGH)
S 39°46'E 92.55'
KING ST.
S 89°42'E 222.40'
PROPERTY LINE
UNITED STATES CELLULAR
SITE PLAN
BROOKINGS, OR
Ontiveros & Associates
Consulting Engineers & Surveyors
JOB No.: USC-98-133
DATE: 1/09/99
DRAWN BY: ALM
SHT. 1 OF 1

U.S. Cellular

COPY #3285

August 7, 2004

Curry County
94235 Moore Street
P.O. Box 746
Gold Beach, OR 97444

Re: Request For Consent To Sublease Space at US Cellular's *North Brookings* site, #573327

U.S. Cellular is committed to working with others in the wireless industry to make maximum use of existing infrastructure and thereby help reduce the need for additional tower construction. As a result, one of our competitors in Oregon, *Nextel Communications*, would like to collocate with us at the tower site we constructed on your land – the site we refer to as North Brookings, #573327. We would like to accommodate their request and, accordingly, pursuant to Section 19 of the Ground Lease between Curry County and USCOC of Oregon RSA # 5, d/b/a U.S. Cellular, dated October 15, 1999, we are requesting that you acknowledge your consent of this arrangement by signing both copies of this letter and returning one copy to us in the enclosed stamped, self-addressed envelope and retaining the other copy for your files.

Thank you for your cooperation in this matter, and should you have any questions please feel free to call us.

Sincerely,

Carol Opiela
Site Specialist-Colocations
773-399-7523

CO/nea

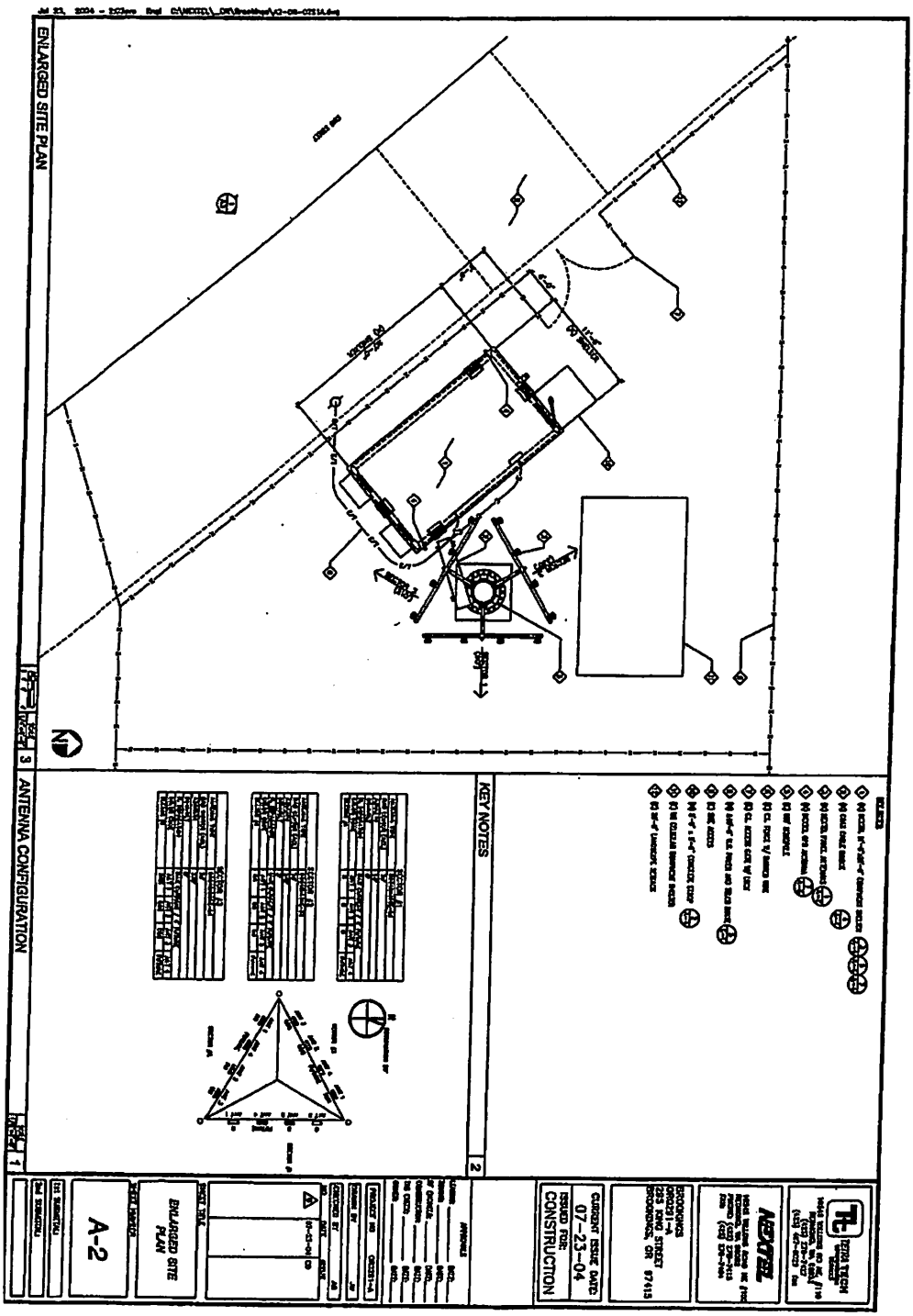
FILED WITH
AUG 2 6 2004
CURRY COUNTY CLERK

Name

Chair, Board of Commissioners
Title

8/25/04
Date

8410 West Bryn Mawr Avenue
Chicago, IL 60631-3486
Tel: 773 399 8900 Fax: 773 399 8936
www.uscellular.com


ENLARGED SITE PLAN
ANTENNA CONFIGURATION
KEY NOTES
CURRENT ISSUE DATE:
07-23-04
ISSUED FOR:
CONSTRUCTION
A-2
ENLARGED SITE PLAN

U.S. Cellular

WUT I #3454

July 20, 2005

Raymond Brown, Commissioner
Curry County
P.O. Box 746
94235 Moore Street
Gold Beach, OR 97444

Re: Request For Consent To Sublease Space at US Cellular's *N. Brookings* site, #573327

Dear Commissioner Brown:

U.S. Cellular is committed to working with others to make maximum use of existing infrastructure and thereby help reduce the need for additional tower construction. As a result, Clearwire would like to collocate with us at the tower site we constructed on your land -- the site we refer to as N. Brookings, #573327. We would like to accommodate their request and, accordingly, pursuant to Section 19 of the Ground Lease between USCOC of Oregon RSA #5, Inc. dated October 15, 1999, we are requesting that you acknowledge your consent of this arrangement by signing both copies of this letter and returning one copy to us in the enclosed stamped, self-addressed envelope and retaining the other copy for your files.

Thank you for your cooperation in this matter, and should you have any questions please feel free to call us.

Sincerely,

Donald L. Dicke
Site Specialist
773-864-3150

FILED WITH
AUG 17 2005
CURRY COUNTY CLERK

Signed

Ralph H. Brown
Printed

Chair, Board of Commissioners 8/1/05
Title Date

Site: Brookings/573327

Lessor's Consent

Curry County is the landlord ("Lessor") under that certain Ground Lease dated October 15, 1999 (the "Lease") with USCOC of Oregon RSA #5, Inc., a Delaware corporation as the tenant ("Lessee"). Lessor hereby consents to the merger of Lessee into Oregon RSA #2, Inc., an Oregon corporation and the transfer of Lessee's interest in the Lease to New Lessee, effective on the effective date of the assignment.

LESSOR:

By: _____
Name: MARILYN SCHAFER
Its: CHAIR, BOARD OF COMMISSIONERS

Dated: 12/21/07

City of Brookings
SPECIAL MEETING Minutes

CITY COUNCIL
Wednesday, June 29, 2011
City Hall Council Chambers, 898 Elk Drive, Brookings, OR 97415

Call to Order
Mayor Anderson called the meeting to order at 7:00pm.

Roll Call
Council Present: Mayor Larry Anderson, Councilors Ron Hedenskog, Dave Gordon, Jake Pieper, and Brent Hodges; a quorum present.

Staff Present: City Manager Gary Milliman, Planning Director Dianne Morris, City Attorney Martha Rice and City Recorder Joyce Heffington.

Others Present: Curry Coastal Pilot Reporter Steve Kadel and approximately 7 public.

Public Hearing
The public hearing was opened at 7:02pm in the matter of File No. APP-1-11/CUP-1-11, an appeal of a conditional use permit for a retail business in an Industrial Park (I-P) district, Shannon Werner, appellant. The applicant is Bi-Mart Corporation.

Under exparte:

- Mayor Anderson said that he was familiar with the location, but had not visited the site specifically and that Nathanial Werner, husband of the appellant, whom he's known for 20 years, had twice attempted to discuss the matter with him, once in front of the Post Office and once in the City Hall Parking lot. On both occasions, Anderson said, he'd had "absolutely no discussion on this matter," with Werner beyond telling him that he could not discuss it.
- Councilor Pieper stated that he'd had past site visits, but not since the Bi-Mart issue had come up. He said he's known Nathaniel Werner for several years and had also conducted business with his employer. Pieper said that Werner had visited him at his place of business two or three times with the bulk of their conversations being "less about this specific issue and more about the overall philosophies of business and what chain stores can do to small towns." Pieper said that he couldn't recall much about the conversations except that he had been "listening more than offering opinions," and had explained to Werner the process and the opportunities he would have to voice his concerns.
- Councilor Hedenskog stated that he had site familiarity typical to any other resident and Councilor Gordon said that he had driven by the site.
- Councilor Hodges said that he drives by the site several times a day and that he'd had three conversations with Nathaniel Werner, one at the school, one at Werner's place of business and one at his place of business, primarily about the general impact of big stores on small towns. He also said that he had talked to Werner about the process.

No questions were asked regarding the exparte contacts.

Hearing no declarations of conflict or personal interest, nor objections as to jurisdiction, Mayor Anderson reviewed the guidelines and entered Exhibits C and D into the record.

Planning Director Morris reviewed the staff report, addressing the conditions of approval, the appellant's concerns, Bi-Mart's responses and the contents of Exhibit D.

Councilor Hedenskog asked Director Morris about non-conforming residences, on-street parking, the height of shrubs in the parking lot, and if the plot plan provided for lighting. Morris replied that the site is zoned industrial and existing residences can remain but no new residences can be added. She also explained that the spaces designated 'No Parking' were a condition of approval to improve visibility for ingress and egress onto Railroad and Cove, and that shrub height of a minimum of three feet with a tree every six feet is required in conformance with parking lot standards. A lighting plan was required, Morris added. Hedenskog then asked if Bi-Mart would be held to the lighting plan as a condition of approval and Morris said they would.

Mayor Anderson asked about existing street lights and Director Morris replied that there were two existing street lights and that as a condition of approval (COA), additional street lights would need to be provided as required by the City Engineer.

The applicant, John Harris, President of Bi-Mart, 86410 Pine Grove Road, Eugene, Oregon, said that he had nothing to add.

Speaking on behalf of the appellant, Jeremiah Scannell, Attorney, P.O. Box 7455, Brookings, said that his clients were not opposed to development but were "opposed to development that continues on at a pace that seems to ignore concerns of local residents," and this is their final opportunity to voice their concerns.

Exhibits E, and F, submitted by Scannell on behalf of the appellant, were entered into the record.

In general, Scannell said his client's concerns related to the greenway, ambient lighting, traffic noise and traffic congestion. His client's specific concerns, Scannell said, were that the lighting plan was inadequate, the traffic study was based on insufficient evidence, and that the proposed fencing was inadequate to shield their residence from lights and car noise. The Werner's, he said, "would be appeased" with the elimination of the 12 parking spaces adjacent to their property and the retention of the greenway, as it exists, or, alternatively, with the installation of a six foot block wall adjacent to the 12 spaces.

Mayor Anderson stated for the record that he had allowed Scannell to speak for close to 15 minutes, as opposed to the prescribed five minutes he was allotted.

In rebuttal to the appellant's testimony, John Harris said that the property is zoned Industrial Park and asked Director Morris if she would provide a list of more intense, outright uses which would be allowed for the property. Morris cited transfer companies, storage yards, warehousing, trucking and rental equipment companies, automobile, truck and boat sales as being outright uses. Harris then said that Bi-Mart had worked very hard to take all factors into consideration and that their lighting diagram is very good. For the most part, Harris said, customers would park in front of the store, which is away from the residential area, and that the 12 parking spaces in question would primarily be used by employees who will come and go infrequently. Harris went on to say that Bi-Mart should be allowed to put in as many

spaces as possible to provide customers more flexibility. The fencing, he added, would be sight obscuring.

Councilor Hedenskog said the proposed vegetation and slatted cyclone fencing would still allow some sound and light to go through, and asked if Bi-Mart would be opposed to putting in a concrete block wall. John Harris said they would not be opposed. Hedenskog then asked Director Morris if any outright uses would be required to provide mitigation; Morris said, no, they would not.

In response to the appellant's testimony, Director Morris pointed out that there is a lighting plan included in the packet, and that lights would be turned off 30 minutes after store closing. She added that ODOT had stated that, at this time, there would not be enough traffic generated at the location to elevate concerns related to traffic congestion.

Councilor Hedenskog commented that the traffic study had not been based on a single weekend, and Director Morris concurred, adding that the studies are performed throughout the year during peak and other times.

There were no requests for additional time to present additional testimony and the hearing was closed at 8:09 pm.

During deliberations, Mayor Anderson asked Director Morris to review the noise ordinance and the process used to ensure that a project is completed to plan. Following Morris' review, Anderson pointed out that other property uses have resulted in similar issues, including issues related to property that he owns. "But," he said, "these things have to go some place." Looking at Bi-mart's plan, Anderson said, "I was quite impressed with it," and added that he thought it would complement the City as a whole.

Councilor Gordon said that he was impressed with Bi-Mart's approach in addressing the appellant's concerns and applauded Bi-Mart's "good neighbor" intentions. Gordon also pointed out that, based on the zoning, other more invasive uses could have gone into this location without any mitigation being required.

Councilor Hedenskog said, since this would be a conditional use in an Industrial Park zone, staff would be looking at it, at least annually, and asked Director Morris if this was correct. Morris said that the use would run with the land, and as long as the conditions are met, there would be no reason for staff to review it again. Hedenskog then asked, should a condition not be met, if the applicant would be required to rectify the situation and Morris said they would. Hedenskog went on to review what had been done to address the appellant's concerns, and concluded that the only issue left to be addressed was that of light coming from vehicles parking in the 12 spaces directly across from the appellant's residence. Hedenskog asked if Council would consider adding a block wall to be located adjacent to the 12 spaces, and/or that the 12 spaces be designated as employee parking only, as a COA.

Councilor Pieper asked about the specifications for fence height along the 12 spaces. Director Morris said that the fence would need to be four feet in height and site obscuring. Pieper pointed out that he too had to deal with issues related to commercial activities, but had to live with these issues because he'd bought his home in a downtown zone. "The appellants," he said, "aren't the only ones with property rights and Bi-Mart has the right to use this property to the best of their ability." He added that he thought the project and conditions of approval were acceptable, as is.

Councilor Hodges said that if he lived where the Werner's lived, and Bi-Mart was willing to put in the block wall, that this would be his choice.

Councilor Gordon also agreed that the block wall would address this last concern, if Bi-Mart was willing to put one in.

Mayor Anderson asked John Harris if Bi-Mart would be willing to put in the block wall and Harris said they would. Anderson then asked if the vegetation requirement would still apply and Director Morris said that it would, and added that putting the block wall behind the vegetation would be more appropriate.

City Manager Milliman suggested language to add the requirement for a four foot high block wall and Councilor Hedenskog said he would prefer that the wall be six feet in height.

Mayor Anderson asked Harris if six feet would be an acceptable height and Harris said that it would not as additional engineering would be required. Due to the elevation at the subject location, he added, a four foot high wall should satisfy the need for blocking headlights and engine noise.

Councilor Hedenskog moved, a second followed, and Council voted unanimously to deny the appeal in this matter, APP-1-11, issued for CUP-1-11 and uphold the Planning Commission's condition of approval based on all of the criteria and evidence that we've received in writing and in this hearing, today, and to [revise] the wording in page 81 [of the packet], #3, , off-street parking requirements, [of the Conditions of Approval] to include a four foot high concrete wall, to be blocked...or... concrete in nature...for the area of the southerly, most southwesterly 12 parking spaces, and to direct staff to prepare final order and findings of facts for Council approval.

Councilor Hedenskog moved, a second followed, and Council voted unanimously to accept final order, findings and facts for CUP-1-11, and Conditions of Approval which also include the alteration as mentioned [in the previous motion] to #3, page 81, [of the packet], four feet high, concrete in nature, wall.

Adjournment

Councilor Gordon moved, a second followed and Council voted unanimously to adjourn by voice vote at 8:46pm.

Respectfully submitted:

ATTESTED:
this _____ day of _____ 2011:

Larry Anderson, Mayor

Joyce Heffington, City Recorder

City of Brookings
Special Meeting MINUTES

CITY COUNCIL
Monday, July 18, 2011, 4:00pm
City Hall Council Chambers, 898 Elk Drive, Brookings, OR 97415

Call to Order

Mayor Anderson called the meeting to order at 6:36pm.

Roll Call

Council Present: Mayor Larry Anderson, Councilors Ron Hedenskog, Dave Gordon, Jake Pieper, and Brent Hodges; a quorum present.

Staff Present: City Manager Gary Milliman

Others Present: Approximately 1 public.

Action Item

Request for Destination Resort Support Letter from Curry County Commission Chair, George Rhodes.

Georgia Nowlin, PO Box 4204, Brookings, generally commented that while, in concept, a destination resort would be a wonderful asset to our communities, she was in opposition to the proposal at this time due to the County's increasingly limited financial and personnel resources. By providing the letter of support, Nowlin said, the City would be supporting whatever the project might entail, moving forward, when too little was known at this time.

Mayor Anderson said that since there appears to be no urgency to provide the letter of support, and that the County will be coming back when it has more information, it would be appropriate to take no action at this time and schedule it for an agenda item when appropriate.

Mayor Anderson moved, Councilor Gordon seconded, and Council voted unanimously by voice vote to choose to not do a letter of support at this time and... [to wait] for the County to contact us with more information and the City Manager ... [to] schedule this as an agenda item for the citizenry of Brookings to come talk about [it] and listen.

Adjournment

Councilor Gordon adjourned, Councilor Hedenskog seconded, and Council voted unanimously by voice vote to adjourn at 4:53pm.

Respectfully submitted:

ATTESTED:
this _____ day of _____ 2011:

_____
Larry Anderson, Mayor

_____
Joyce Heffington, City Recorder

City of Brookings
MEETING Minutes

CITY COUNCIL
Monday, July 25, 2011
City Hall Council Chambers, 898 Elk Drive, Brookings, OR 97415

Call to Order
Mayor Anderson called the meeting to order at 7:00pm.

Roll Call

Council Present: Mayor Larry Anderson, Councilors Ron Hedenskog, Dave Gordon, Jake Pieper, and Brent Hodges; a quorum present.

Staff Present: City Manager Gary Milliman, City Attorney Martha Rice, Parks Facilities Planner Code Erhart and City Recorder Joyce Heffington.

Others Present: Curry Coastal Pilot Reporter Steve Kadel and 2 public.

Ceremonies/Appointments/Announcements
Appointment of William Hamilton to Traffic Safety Committee Position 1.

Councilor Gordon moved, a second followed and Council voted unanimously to appoint William Hamilton to Traffic Safety Committee Position 1.

Mayor Anderson announced July Yard of the Month awards as follows:

- Yard of the Month – Carlo & Frances Pelaccio, 810 Highland Avenue
- Most Improved - John and Barbie Breneiser, 17374 Blueberry Road
- Commercial – Dan Brattain, Cal-Ore Life Flights, 311 Cove Road

Scheduled Public Appearances
Oasis House Director, Lea Sevey, presented a brief update on the Oasis Shelter House which offers the only safe house from Coos Bay to Eureka and the only shelter from Coos Bay to Crescent City. Sevey said that Oasis House works closely with other non-profits and government agencies. The shelter, she reported, served 79 people this last year, and 150 were served through their outreach program. In general, Sevey said the number of victims of domestic violence is probably higher than indicated and invited anyone who is interested in Oasis House finances to visit the IRS or Guidestar.com websites to learn more about their financial status. Currently, she said, they are refurbishing donated office space in Gold Beach for use in their outreach program. Sevey also introduced Pam Billington who is working with the Brookings-Harbor Shelter Project, a group with whom Oasis House is partnering.

Staff Reports
Authorization for Mayor to execute the Purchase and Sale Agreement for real property described as "Southbound Lane of Mill Beach Road" for $38,200.

City Manager Milliman provided the staff report, pointing out that this project had been a topic of Council discussion for some time. The acquisition would allow the City to improve and maintain the Mill Beach access.

Councilor Hedenskog moved, a second followed and Council voted unanimously to authorize the Mayor to initiate a Purchase and Sale Agreement for real property in the Mill Beach area, purchasing a public right of way, for $38,200.

Approval of the 2011 Parks Master Plan Update and Capital Improvement Plan.

City Manager Milliman provided the staff report with input from Parks Facilities Planner Erhart. Erhart was employed by the City through the R.A.R.E. program. The Parks Master Plan update which was reviewed by several local community groups, both the Parks and Planning Commissions, and the City Council in two separate workshops was Erhart's major assignment during his 11 month tenure.

Mayor Anderson said that the document is available for public review and that he appreciated Erhart's efforts.

Councilor Hedenskog said that he had gone through the entire plan and found it to be a good document, with excellent graphics and an enormous amount of information about the City's parks and suggested that the plan be posted on the website. Hedenskog congratulated Erhart on a "job well done."

The Plan, which was posted with the July 25th Council agenda packet on the City's website, at City Hall and at the Chetco Community Library, will remain at all three locations in its final form as well as being available on the Parks and Recreation page of the City's website.

Councilor Pieper moved, a second followed and Council voted unanimously to adopt the 2011 Parks Master Plan and Capital Improvement Plan.

Consent Calendar

a. Approve Council minutes for July 25, 2011.
b. Approve Liquor License Application for Pine Cone Tavern.
c. Accept annual request for grant funding from Department of Land Conversation and Development (DLCD) in the amount of $6,000.
d. Receive monthly financial report for June 2011.

Councilor Hedenskog moved, a second followed and Council voted unanimously to approve the Consent Calendar as written.

Adjournment

Councilor Gordon moved, a second followed and Council voted unanimously by voice vote to adjourn at 7:19pm.

Respectfully submitted:

ATTESTED:
this _____ day of _____ 2011:

Larry Anderson, Mayor

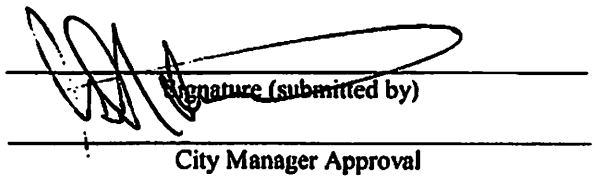
Joyce Heffington, City Recorder

CITY OF BROOKINGS

COUNCIL AGENDA REPORT

Meeting Date: August 8, 2011

Originating Dept: City Council



Subject: City Manager Employment Agreement

Recommended Motion: Motion to authorize the Mayor to execute Employment Agreement with Gary Milliman

Background/Discussion:
The City entered into an employment agreement with the City Manager in 2007 and it is the desire of the City Council to continue the current employment relationship with the present City Manager. The City Manager and Mayor have conferred in the development of a new employment agreement, which has been reviewed by the City Attorney.

A number of provisions in the initial 2007 agreement, such as payment of relocation expenses, are longer relevant. The City Council wishes to revise change the provision with respect to employee health insurance by providing that the City Manager share in the cost of the premium. There are other minor changes to the agreement terms involving mileage reimbursement, vacation and sick leave accrual, adjusting the salary amount to reflect merit salary increases received in 2008 and 2009, and use of accumulated sick and vacation leave upon retirement.

Attachment(s):

a. Employment Agreement

EMPLOYMENT AGREEMENT

THIS EMPLOYMENT AGREEMENT ("Agreement"), is deemed effective the _____ day of _____, 2011, and is made by and between the **CITY OF BROOKINGS**, a municipal corporation, ("City"), and **GARY D. MILLIMAN**, ("Employee"). The parties to this Agreement do hereby enter into the terms, conditions, covenants, duties and responsibilities as follows:

RECITALS

WHEREAS, City is a municipal corporation providing a wide range of public services to the community;

WHEREAS, for City to insure that its responsibilities to the health and safety of the public are met at all times, the City must attract and retain in its employment a City Manager who exhibits the knowledge, experience, technical ability, professionalism and qualities of leadership necessary to meet the City's objectives;

WHEREAS, it is the desire of the City Council to provide certain benefits, establish certain conditions of employment and set working conditions for the position of City Manager;

WHEREAS, it is the desire of the City Council to: (1) retain the services of Employee and to provide inducement for him to remain in such employment; (2) establish a clear and mutually understood system of compensating Employee; (3) provide a just means for terminating the services of Employee at such time as he may be unable to discharge fully his duties due to disability or retirement or when the City Council may desire to otherwise terminate his employment;

WHEREAS, Employee was first appointed as City Manager through that employment agreement dated May 22, 2007, and has served in the position of City Manager continuously since July 9, 2007.

NOW THEREFORE, in consideration of the mutual covenants herein contained and as authorized by the Brookings City Charter and Municipal Code, applicable City Personnel Rules and Regulations, and in accordance with Oregon Revised Statutes, the parties hereto agree as follows:

Section 1 Duties

A. City hereby reaffirms the employment of Employee as City Manager to perform the duties and functions as specified in the Brookings City Charter and Municipal Code, and to perform such other legally permissible duties as the City Council shall from time to time assign.
B. In addition to the duties and responsibilities defined, during the term of this Agreement, and any extensions thereto, Employee shall also serve as Executive Director for the Urban Renewal Agency.
C. The Employee and City Council shall mutually establish performance goals and objectives to be met by the Employee for each year of this Agreement. Said objectives shall be established as part of an annual evaluation process.
D. Employee shall not spend more than ten (10) hours per week in teaching, consulting or other non-Employee connected business without the prior written approval of the City Council.

Section 2 Compensation and Review

A. Employee's annual salary shall be $102,000.
B. Employer shall conduct an annual performance evaluation of Employee using such criteria as Employer may establish with input from the Employee.
C. The City Council shall review Employees salary annually and make such adjustments as the City Council deems appropriate based upon Employee performance and increases in the cost of living.

Section 3 Schedule and Severance.

A. The employee's schedule of work each day and week shall vary in accordance with the work required to be performed. It is recognized that employee must devote a great deal of his time outside of normal office hours to business of the City and, to that end, will be allowed to take reasonable amount of compensatory time off during normal business hours. Employee must use accrued vacation leave, sick leave or other allowed leave if absence from work extends to more than two consecutive work days.
B. In the event Employee is terminated by the City Council, he shall be entitled to severance pay equal to total salary and benefits for four (4) months. In the event Employee is terminated for violation of local, state or federal laws, Employer shall have no obligation to pay the aforementioned aggregate severance sum.
C. In the event Employee voluntarily resigns his position with Employer, Employee shall give Employer 30 days written notice in advance, unless the parties agree in writing otherwise.

Section 4 Automobile.

A. As Employee will be required to use his personal automobile in the conduct of City business, Employer shall pay to employee a monthly automobile stipend of $350. In addition, Employee shall receive payment at rate provided in IRS guidelines for all miles driven on official business outside of Curry and Del Norte counties.
B. Employee shall not use a City-owned vehicle, except as a passenger or in the event of an emergency.
C. Employee shall name Employer as an "additional named insured" on Employee's personal automobile liability insurance policy.

Section 5 Other Benefits

A. Employee shall be entitled to observe holidays on the same basis as other City management employees. Employee shall earn vacation leave at a rate of 160 hours annually, shall be allowed to accrue unused vacation leave with no maximum, and the full value of any such unused vacation leave shall be paid to Employee upon termination, resignation or retirement. The rate of accrual of vacation leave shall be increased to 200 hours annually, upon Employee's completion of five years of service with the City. Employee shall earn sick leave at a rate of 96 hours annually, shall be allowed to accrue unused sick leave to a maximum of 720 hours, and 25 per cent (25%) of the value of any such unused sick leave shall be paid to employee upon termination, resignation or retirement.
B. Employer shall reimburse Employee for the cost of maintaining in force a policy of term life insurance for the benefit of Employees survivors in the amount of $150,000.
C. Employer shall pay both the Employer and Employee contribution on behalf of Employee for his membership in the Public Employees Retirement System.

D. Employer shall contribute a maximum of 90 per cent (90%) per month toward the premium for health, dental and vision care insurance for Employer and his spouse. Such insurance may be provided through the City's health insurance program or, at Employees option, through the California Public Employees Retirement System Health Insurance Program.
E. Employee shall be provided with all other benefits as are provided to a majority of Department Directors.
F. In the event of Employees death while still employed with City, the heirs at law and executors of Employee shall be entitled to the value of accrued benefits as prescribed in this Section to which Employee would have been entitled.
G. Diminutive use of City telecommunications resources, such as occasional use of City telephone for personal use, shall be considered a part of Employee's compensation.

Section 6 Other Terms and Conditions

A. Employer agrees to budget for any pay for professional dues and subscriptions of Employee necessary for his continuation and participation in national, regional, state and local associations and organizations necessary and desirable for his continued professional participation, growth and advancement, and the good of the Employer.
B. Employer hereby agrees to budget for and to pay for attendance, travel and reasonable subsistence expenses of Employee for official travel and professional development including, but not limited to, the ICMA Annual Conference, League of Oregon Cities Annual Conference, the League of Oregon Cities Annual City Manager Conference.
C. Employer recognizes that certain expenses of a non-personal and generally job-affiliated nature are incurred by Employee, and hereby agrees to reimburse or pay said general expenses and the Administrative Services Director is hereby authorized to disburse such money upon receipt of duly executed expenses receipts, statements or personal affidavits.
D. At Employee's option, Employee may use accumulated vacation and sick leave, for which he is eligible to receive payment upon retirement, to extend his retirement date beyond his actual last day of work for a maximum period of four months.

Section 7 Indemnification.

A. City shall defend, save harmless and indemnify Employee against any tort, professional liability claim, or demand or other legal action, whether groundless or otherwise, arising out of an alleged act of omission occurring in the performance of Employee's duties as defined the Agreement. City will compromise and settle any such claim or suit and pay the amount of any settlement or judgment rendered for Employee's activities performed within the course and scope of his employment.

Section 8 Bonding.

A. Employer shall bear the full costs of any fidelity or other bonds required of the Employee under any law or ordinance.

Section 9 Modifications.

A. Any modification to this Agreement must be in writing and signed by both parties executing this Agreement to be effective.

Section 10 Effect of Waiver.

A. The failure of either party to insist on strict compliance with any of the terms, covenants or conditions of this Agreement by the other party shall not be deemed a waiver of that term, covenant or condition, nor shall any waiver or relinquishment of any right or power at any one time or times be deemed a waiver or relinquishment of that right or power for all or any other times.

Section 11 Entire Agreement.

A. Each of the Recitals stated above is incorporated by reference as if fully set forth herein.
B. Each party agrees that this Agreement is valid and shall be binding upon said party. Each party to this Agreement acknowledges that no representation, inducements, promises or agreements, orally or otherwise, have been made by any party, or anyone acting on behalf of any party, which are not embodied herein and that no other agreement, statement or promise not contained or referenced in this Agreement shall be valid or binding on either party. The date of this Agreement shall be deemed to be the date last signed below by the parties.

IN WITNESS WHEREOF, the City of Brookings has caused this Agreement to be signed and executed on its behalf by the Mayor and duly attested by the City Recorder, and the Employee has signed and executed three (3) copies of this Agreement.

Dated: _____ **"CITY"**

By: _____
Mayor Larry Anderson

Dated: _____ **"EMPLOYEE"**

By: _____
Gary D. Milliman

ATTEST:

_____
City Recorder

APPROVED AS TO FORM:

_____
City Attorney

CITY OF BROOKINGS

COUNCIL AGENDA REPORT

Meeting Date: August 8, 2011

Originating Dept: City Manager

Signature (submitted by)

City Manager Approval

Subject: Temporary Easements for Vista Ridge Waterline Project

Recommended Motion:
This is a Consent Calendar item authorizing the City Manager to sign temporary waterline construction easements for the Vista Ridge Waterline Improvement project.

Financial Impact:
Minimal recording costs.

Background/Discussion:
The Vista Ridge Waterline Improvements project requires ingress and egress access the front portion of four properties. It is necessary to obtain temporary construction easements to provide this access. The easements will expire in December 2012.

Report Criteria:
Report type: Summary

GL Period	Check Issue Date	Check Number	Vendor Number	Payee	Check GL Account	Amount
07/11	07/08/2011	66442	4236	Bruce Bros., Inc.	10002005	4,726.00
07/11	07/08/2011	66443	182	Kerr Hardware	10002005	2,517.05
07/11	07/08/2011	66444	4810	Kubota & Bud	10002005	1,253.18
07/11	07/08/2011	66445	4812	TrailersPlus Eugene	10002005	4,100.00
07/11	07/14/2011	66446	2149	American Backflow Prev Assoc	10002005	80.00
07/11	07/14/2011	66447	2505	Aramark	10002005	111.30
07/11	07/14/2011	66448	3238	AT&T Mobile	10002005	145.54
07/11	07/14/2011	66449	4817	Beal, Amy	10002005	85.00
07/11	07/14/2011	66450	715	Budge McHugh Supply	10002005	423.88
07/11	07/14/2011	66451	4193	C & K Markets	10002005	158.27
07/11	07/14/2011	66452	1373	Cascade Fire Equipment	10002005	1,020.50
07/11	07/14/2011	66453	3834	Clean Sweep Janitorial Service	10002005	700.00
07/11	07/14/2011	66454	182	Coos-Curry Electric	10002005	56.85
07/11	07/14/2011	66455	2542	Crystal Fresh Bottled Water	10002005	26.00
07/11	07/14/2011	66456	173	Curry Equipment Company	10002005	915.76
07/11	07/14/2011	66457	195	Curry Transfer & Recycling	10002005	628.75
07/11	07/14/2011	66458	166	Dan's Auto & Marine Electric	10002005	401.03
07/11	07/14/2011	66459	259	Da-Tone Rock Products	10002005	222.56
07/11	07/14/2011	66460	2640	Dyer Partnership Inc., The	10002005	28,818.22
07/11	07/14/2011	66461	261	Engineered Control Products	10002005	756.18
07/11	07/14/2011	66462	153	Ferrellgas	10002005	462.97
07/11	07/14/2011	66463	298	Freeman Rock, Inc	10002005	285.00
07/11	07/14/2011	66464	269	Grainger	10002005	20.99
07/11	07/14/2011	66465	198	Grants Pass Water Lab	10002005	352.00
07/11	07/14/2011	66466	1130	H.D. Fowler	10002005	4,099.20
07/11	07/14/2011	66467	167	Hach Company	10002005	930.28
07/11	07/14/2011	66468	4572	Hon Company, The	10002005	470.66
07/11	07/14/2011	66469	4813	Johnson, Lynzi	10002005	40.00
07/11	07/14/2011	66470	4814	Krames Staywell	10002005	118.16
07/11	07/14/2011	66471	1397	L N Curtis & Sons	10002005	4,235.20
07/11	07/14/2011	66472	386	Lab Safety Supply Inc	10002005	81.57
07/11	07/14/2011	66473	328	Les Schwab Tire Center	10002005	794.79
07/11	07/14/2011	66474	3756	Newark InOne	10002005	201.18
07/11	07/14/2011	66475	3159	Northcoast Health Screening	10002005	225.00
07/11	07/14/2011	66476	3603	Norwest Safety	10002005	349.88
07/11	07/14/2011	66477	2283	NW Technical, Inc	10002005	3,500.00
07/11	07/14/2011	66478	279	One Call Concepts, Inc	10002005	31.68
07/11	07/14/2011	66479	1561	Pacific Coast Hearing Center	10002005	30.00
07/11	07/14/2011	66480	1029	Pitney Bowes Purchase Power	10002005	1,000.00
07/11	07/14/2011	66481	4815	PLATT	10002005	6,934.72
07/11	07/14/2011	66482	3634	Pollard Water.com - East	10002005	2,057.50
07/11	07/14/2011	66483	4105	Precision Eyecare PC	10002005	368.00
07/11	07/14/2011	66484	3	Victoria Kessler	10002005	38.86
07/11	07/14/2011	66485	3	Amanda Mendenhall	10002005	61.85
07/11	07/14/2011	66486	3	Eileen Smith	10002005	76.90
07/11	07/14/2011	66487	4383	Robert N. Black, Attorney	10002005	2,563.50
07/11	07/14/2011	66488	4659	Rock Island Design	10002005	94.70
07/11	07/14/2011	66489	169	Roto Rooter	10002005	271.00
07/11	07/14/2011	66490	380	Stadelman Electric Inc	10002005	2,516.20
07/11	07/14/2011	66491	1197	Teledyne Isco Inc	10002005	188.80
07/11	07/14/2011	66492	142	Tidewater Contractors Inc	10002005	220.87
07/11	07/14/2011	66493	4816	Top Gear Transmissions	10002005	164.95
07/11	07/14/2011	66494	797	Town & Country Animal Clinic	10002005	152.00

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GL Period	Check Issue Date	Check Number	Vendor Number	Payee	Check GL Account	Amount
07/11	07/14/2011	66495	3752	Trace Analytics Inc	10002005	81.00
07/11	07/14/2011	66496	136	United Pipe & Supply Co Inc	10002005	1,748.95
07/11	07/14/2011	66497	990	UPS	10002005	39.89
07/11	07/14/2011	66498	432	USA Bluebook	10002005	288.38
07/11	07/14/2011	66499	4370	Verizon Business	10002005	220.16
07/11	07/14/2011	66500	2863	Verizon Wireless	10002005	86.02
07/11	07/20/2011	66501	882	Advanced Security Systems	10002005	70.50
07/11	07/20/2011	66502	3759	Apple Time Inc	10002005	523.14
07/11	07/20/2011	66503	4778	Ausland Builders, Inc.	10002005	85,385.99
07/11	07/20/2011	66504	4752	Border Coast Regional Airport Authority	10002005	2,131.00
07/11	07/20/2011	66505	335	Branom Instrument Co	10002005	87.94
07/11	07/20/2011	66506	4819	Carolyn Milliman	10002005	200.00
07/11	07/20/2011	66507	370	CCIS	10002005	86,217.14
07/11	07/20/2011	66508	3015	Charter Communications	10002005	84.90
07/11	07/20/2011	66509	151	Curry Coastal Pilot	10002005	3,442.04
07/11	07/20/2011	66510	1	Michael Bunk	10002005	31.15
07/11	07/20/2011	66511	1	Century 21 Agate Realty	10002005	38.59
07/11	07/20/2011	66512	1	Coastal Country Prop Mgmt	10002005	47.89
07/11	07/20/2011	66513	1	Eric Goff	10002005	75.97
07/11	07/20/2011	66514	1	Michelle Harris	10002005	21.71
07/11	07/20/2011	66515	1	Kama & John Hedding	10002005	14.71
07/11	07/20/2011	66516	1	Don Lorensen	10002005	13.42
07/11	07/20/2011	66517	1	Travis Wright	10002005	14.95
07/11	07/20/2011	66518	2640	Dyer Partnership Inc., The	10002005	12,130.32
07/11	07/20/2011	66519	261	Engineered Control Products	10002005	658.37
07/11	07/20/2011	66520	4646	Frontier	10002005	678.56
07/11	07/20/2011	66521	4821	Glazebrook, Barbara	10002005	18,350.00
07/11	07/20/2011	66522	4171	In-Motion Graphics	10002005	144.00
07/11	07/20/2011	66523	202	League of Oregon Cities	10002005	4,589.80
07/11	07/20/2011	66524	867	Local Gov't Personnel Inst	10002005	6,961.27
07/11	07/20/2011	66525	4728	Oregon Department of Revenue	10002005	15.70
07/11	07/20/2011	66526	699	Oregon Dept of Transportation	10002005	651.78
07/11	07/20/2011	66527	695	P & S Construction Co, Inc	10002005	12,250.00
07/11	07/20/2011	66528	322	Postmaster	10002005	25.00
07/11	07/20/2011	66529	187	Quality Fast Lube & Oil	10002005	139.00
07/11	07/20/2011	66530	983	Randy J Gorman Inc	10002005	64.20
07/11	07/20/2011	66531	4818	Sanders, Christine	10002005	65.00
07/11	07/20/2011	66532	142	Tidewater Contractors Inc	10002005	948.35
07/11	07/20/2011	66533	861	Village Express Mail Center	10002005	8.18
07/11	07/20/2011	66534	551	Western Pacific Tree Serv Inc	10002005	2,500.00
07/11	07/28/2011	66535	4801	Ali's Graphic Shirts & More	10002005	1,081.00
07/11	07/28/2011	66536	682	Al's Radio Shack	10002005	39.99
07/11	07/28/2011	66537	4822	Atlantic Tactical	10002005	399.63
07/11	07/28/2011	66538	2407	Blue Star Gas	10002005	3,420.82
07/11	07/28/2011	66539	4827	Boldt, Carlisle & Smith LLC	10002005	2,480.00
07/11	07/28/2011	66540	416	Brookings Lock & Safe Co	10002005	22.50
07/11	07/28/2011	66541	715	Budge McHugh Supply	10002005	480.33
07/11	07/28/2011	66542	3015	Charter Communications	10002005	990.00
07/11	07/28/2011	66543	822	Coast Auto Center	10002005	54.00
07/11	07/28/2011	66544	4745	Coast Welding	10002005	125.00
07/11	07/28/2011	66545	183	Colvin Oil Company	10002005	3,199.37
07/11	07/28/2011	66546	182	Coos-Curry Electric	10002005	21,899.72
07/11	07/28/2011	66547	182	Coos-Curry Electric	10002005	1,789.37
07/11	07/28/2011	66548	1620	Curry County Public Services	10002005	64.00
07/11	07/28/2011	66549	1	Ken Bishop	10002005	76.01
07/11	07/28/2011	66550	1	Century 21 Agate Realty	10002005	60.00

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Report Criteria:
Report type: Summary

GL Period	Check Issue Date	Check Number	Vendor Number	Payee	Check GL Account	Amount
07/11	07/08/2011	66442	4236	Bruce Bros., Inc.	10002005	4,726.00
07/11	07/08/2011	66443	162	Kerr Hardware	10002005	2,517.05
07/11	07/08/2011	66444	4810	Kubota & Bud	10002005	1,253.18
07/11	07/08/2011	66445	4812	TrailersPlus Eugene	10002005	4,100.00
07/11	07/14/2011	66446	2149	American Backflow Prev Assoc	10002005	80.00
07/11	07/14/2011	66447	2505	Aramark	10002005	111.30
07/11	07/14/2011	66448	3238	AT&T Mobile	10002005	145.54
07/11	07/14/2011	66449	4817	Beal, Amy	10002005	85.00
07/11	07/14/2011	66450	715	Budge McHugh Supply	10002005	423.88
07/11	07/14/2011	66451	4193	C & K Markets	10002005	158.27
07/11	07/14/2011	66452	1373	Cascade Fire Equipment	10002005	1,020.50
07/11	07/14/2011	66453	3834	Clean Sweep Janitorial Service	10002005	700.00
07/11	07/14/2011	66454	182	Coos-Curry Electric	10002005	56.85
07/11	07/14/2011	66455	2542	Crystal Fresh Bottled Water	10002005	26.00
07/11	07/14/2011	66456	173	Curry Equipment Company	10002005	915.76
07/11	07/14/2011	66457	195	Curry Transfer & Recycling	10002005	628.75
07/11	07/14/2011	66458	166	Dan's Auto & Marine Electric	10002005	401.03
07/11	07/14/2011	66459	259	Da-Tone Rock Products	10002005	222.56
07/11	07/14/2011	66460	2640	Dyer Partnership Inc., The	10002005	28,818.22
07/11	07/14/2011	66461	261	Engineered Control Products	10002005	756.18
07/11	07/14/2011	66462	153	Ferrellgas	10002005	462.97
07/11	07/14/2011	66463	298	Freeman Rock, Inc	10002005	285.00
07/11	07/14/2011	66464	269	Grainger	10002005	20.99
07/11	07/14/2011	66465	198	Grants Pass Water Lab	10002005	352.00
07/11	07/14/2011	66466	1130	H.D. Fowler	10002005	4,099.20
07/11	07/14/2011	66467	167	Hach Company	10002005	930.28
07/11	07/14/2011	66468	4572	Hon Company, The	10002005	470.66
07/11	07/14/2011	66469	4813	Johnson, Lynzi	10002005	40.00
07/11	07/14/2011	66470	4814	Krames Staywell	10002005	118.16
07/11	07/14/2011	66471	1397	L N Curtis & Sons	10002005	4,235.20
07/11	07/14/2011	66472	386	Lab Safety Supply Inc	10002005	81.57
07/11	07/14/2011	66473	328	Les Schwab Tire Center	10002005	794.79
07/11	07/14/2011	66474	3756	Newark InOne	10002005	201.18
07/11	07/14/2011	66475	3159	Northcoast Health Screening	10002005	225.00
07/11	07/14/2011	66476	3603	Norwest Safety	10002005	349.88
07/11	07/14/2011	66477	2283	NW Technical, Inc	10002005	3,500.00
07/11	07/14/2011	66478	279	One Call Concepts, Inc	10002005	31.68
07/11	07/14/2011	66479	1561	Pacific Coast Hearing Center	10002005	30.00
07/11	07/14/2011	66480	1029	Pitney Bowes Purchase Power	10002005	1,000.00
07/11	07/14/2011	66481	4815	PLATT	10002005	6,934.72
07/11	07/14/2011	66482	3834	Pollard Water.com - East	10002005	2,057.50
07/11	07/14/2011	66483	4105	Precision Eyecare PC	10002005	368.00
07/11	07/14/2011	66484	3	Victoria Kessler	10002005	38.86
07/11	07/14/2011	66485	3	Amanda Mendenhall	10002005	61.85
07/11	07/14/2011	66486	3	Eileen Smith	10002005	76.90
07/11	07/14/2011	66487	4363	Robert N. Black, Attorney	10002005	2,563.50
07/11	07/14/2011	66488	4659	Rock Island Design	10002005	94.70
07/11	07/14/2011	66489	169	Roto Rooter	10002005	271.00
07/11	07/14/2011	66490	380	Stadelman Electric Inc	10002005	2,516.20
07/11	07/14/2011	66491	1197	Teledyne Isco Inc	10002005	188.80
07/11	07/14/2011	66492	142	Tidewater Contractors Inc	10002005	220.87
07/11	07/14/2011	66493	4816	Top Gear Transmissions	10002005	164.95
07/11	07/14/2011	66494	797	Town & Country Animal Clinic	10002005	152.00

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07/11	07/14/2011	66495	3752	Trace Analytics Inc	10002005	81.00
07/11	07/14/2011	66496	136	United Pipe & Supply Co Inc	10002005	1,748.95
07/11	07/14/2011	66497	990	UPS	10002005	39.89
07/11	07/14/2011	66498	432	USA Bluebook	10002005	288.38
07/11	07/14/2011	66499	4370	Verizon Business	10002005	220.16
07/11	07/14/2011	66500	2863	Verizon Wireless	10002005	86.02
07/11	07/20/2011	66501	882	Advanced Security Systems	10002005	70.50
07/11	07/20/2011	66502	3759	Apple Time Inc	10002005	523.14
07/11	07/20/2011	66503	4778	Ausland Builders, Inc.	10002005	85,385.99
07/11	07/20/2011	66504	4752	Border Coast Regional Airport Authority	10002005	2,131.00
07/11	07/20/2011	66505	335	Branom Instrument Co	10002005	87.94
07/11	07/20/2011	66506	4819	Carolyn Milliman	10002005	200.00
07/11	07/20/2011	66507	370	CCIS	10002005	86,217.14
07/11	07/20/2011	66508	3015	Charter Communications	10002005	84.90
07/11	07/20/2011	66509	151	Curry Coastal Pilot	10002005	3,442.04
07/11	07/20/2011	66510	1	Michael Bunk	10002005	31.15
07/11	07/20/2011	66511	1	Century 21 Agate Realty	10002005	38.59
07/11	07/20/2011	66512	1	Coastal Country Prop Mgmt	10002005	47.89
07/11	07/20/2011	66513	1	Eric Goff	10002005	75.97
07/11	07/20/2011	66514	1	Michelle Harris	10002005	21.71
07/11	07/20/2011	66515	1	Kama & John Hedding	10002005	14.71
07/11	07/20/2011	66516	1	Don Lorensen	10002005	13.42
07/11	07/20/2011	66517	1	Travis Wright	10002005	14.95
07/11	07/20/2011	66518	2640	Dyer Partnership Inc., The	10002005	12,130.32
07/11	07/20/2011	66519	261	Engineered Control Products	10002005	658.37
07/11	07/20/2011	66520	4646	Frontier	10002005	678.56
07/11	07/20/2011	66521	4821	Glazebrook, Barbara	10002005	18,350.00
07/11	07/20/2011	66522	4171	In-Motion Graphics	10002005	144.00
07/11	07/20/2011	66523	202	League of Oregon Cities	10002005	4,589.80
07/11	07/20/2011	66524	867	Local Gov't Personnel Inst	10002005	6,961.27
07/11	07/20/2011	66525	4728	Oregon Department of Revenue	10002005	15.70
07/11	07/20/2011	66526	699	Oregon Dept of Transportation	10002005	651.78
07/11	07/20/2011	66527	695	P & S Construction Co, Inc	10002005	12,250.00
07/11	07/20/2011	66528	322	Postmaster	10002005	25.00
07/11	07/20/2011	66529	187	Quality Fast Lube & Oil	10002005	139.00
07/11	07/20/2011	66530	963	Randy J Gorman Inc	10002005	64.20
07/11	07/20/2011	66531	4818	Sanders, Christine	10002005	65.00
07/11	07/20/2011	66532	142	Tidewater Contractors Inc	10002005	948.35
07/11	07/20/2011	66533	861	Village Express Mail Center	10002005	8.18
07/11	07/20/2011	66534	551	Western Pacific Tree Serv Inc	10002005	2,500.00
07/11	07/28/2011	66535	4801	Ali's Graphic Shirts & More	10002005	1,081.00
07/11	07/28/2011	66536	682	Al's Radio Shack	10002005	39.99
07/11	07/28/2011	66537	4822	Atlantic Tactical	10002005	399.63
07/11	07/28/2011	66538	2407	Blue Star Gas	10002005	3,420.82
07/11	07/28/2011	66539	4827	Boldt, Carlisle & Smith LLC	10002005	2,480.00
07/11	07/28/2011	66540	416	Brookings Lock & Safe Co	10002005	22.50
07/11	07/28/2011	66541	715	Budge McHugh Supply	10002005	480.33
07/11	07/28/2011	66542	3015	Charter Communications	10002005	990.00
07/11	07/28/2011	66543	822	Coast Auto Center	10002005	54.00
07/11	07/28/2011	66544	4745	Coast Welding	10002005	125.00
07/11	07/28/2011	66545	183	Colvin Oil Company	10002005	3,199.37
07/11	07/28/2011	66546	182	Coos-Curry Electric	10002005	21,899.72
07/11	07/28/2011	66547	182	Coos-Curry Electric	10002005	1,789.37
07/11	07/28/2011	66548	1620	Curry County Public Services	10002005	64.00
07/11	07/28/2011	66549	1	Ken Bishop	10002005	76.01
07/11	07/28/2011	66550	1	Century 21 Agate Realty	10002005	60.00

M = Manual Check, V = Void Check

GL Period	Check Issue Date	Check Number	Vendor Number	Payee	Check GL Account	Amount
07/11	07/28/2011	66551	1	Chetco Federal Credit Union	10002005	85.22
07/11	07/28/2011	66552	1	Shirley Crocket	10002005	93.11
07/11	07/28/2011	66553	1	Christie Davis	10002005	50.16
07/11	07/28/2011	66554	1	Dixie Elrod	10002005	40.11
07/11	07/28/2011	66555	1	Paula Hilderbrand	10002005	42.21
07/11	07/28/2011	66556	1	Berdine Leuwer	10002005	59.38
07/11	07/28/2011	66557	1	Frank Logan	10002005	10.87
07/11	07/28/2011	66558	1	Frank Van Meter	10002005	11.61
07/11	07/28/2011	66559	1	Watwood, Becky	10002005	60.00
07/11	07/28/2011	66560	1	John White	10002005	17.17
07/11	07/28/2011	66561	371	Dept. of Environmental Quality	10002005	457.00
07/11	07/28/2011	66562	484	DMV	10002005	92.50
07/11	07/28/2011	66563	4357	Downtown Commerical Center	10002005	200.00
07/11	07/28/2011	66564	145	EBS Trust	10002005	39.17
07/11	07/28/2011	66565	3342	Fastenal	10002005	293.04
07/11	07/28/2011	66566	1778	Fluid Connector Products, Inc	10002005	870.64
07/11	07/28/2011	66567	4646	Frontier	10002005	1,023.55
07/11	07/28/2011	66568	338	GC Systems Inc	10002005	523.08
07/11	07/28/2011	66569	2592	GFS Chemicals Inc	10002005	160.13
07/11	07/28/2011	66570	269	Grainger	10002005	215.72
07/11	07/28/2011	66571	1130	H.D. Fowler	10002005	987.55
07/11	07/28/2011	66572	139	Harbor Logging Supply	10002005	1,094.61
07/11	07/28/2011	66573	994	Hughes Fire Equipment	10002005	1,063.50
07/11	07/28/2011	66574	4826	Jennifer Hathaway	10002005	200.00
07/11	07/28/2011	66575	867	Local Gov't Personnel Inst	10002005	285.00
07/11	07/28/2011	66576	4793	Nor-Pac Power Systems LLC	10002005	7,937.52
07/11	07/28/2011	66577	3297	OAWU	10002005	340.00
07/11	07/28/2011	66578	2342	Office of Water Progrms	10002005	109.00
07/11	07/28/2011	66579	683	OR Assoc Chiefs of Police	10002005	83.00
07/11	07/28/2011	66580	584	Oregon Municipal Judges Assoc	10002005	180.00
07/11	07/28/2011	66581	3264	Pacific Electrical Contr Inc	10002005	758.00
07/11	07/28/2011	66582	252	Paramount Pest Control	10002005	42.00
07/11	07/28/2011	66583	866	Pitney Bowes Global Financial	10002005	137.00
07/11	07/28/2011	66584	207	Quill Corporation	10002005	1,766.82
07/11	07/28/2011	66585	4823	Shannon Warner	10002005	269.33
07/11	07/28/2011	66586	3093	Shelton Turnbull Printers Inc	10002005	149.49
07/11	07/28/2011	66587	956	Suiter's Paint & Body	10002005	2,554.25
07/11	07/28/2011	66588	4824	Thomas F Levak, Arbitrator/Mediator	10002005	300.00
07/11	07/28/2011	66589	2586	TMG Services Inc	10002005	134.03
07/11	07/28/2011	66590	4820	United States Geological Survey	10002005	8,430.00
07/11	07/28/2011	66591	990	UPS	10002005	67.00
07/11	07/28/2011	66592	861	Village Express Mail Center	10002005	26.95
07/11	07/28/2011	66593	2122	Cardmember Service	10002005	2,519.74
07/11	07/28/2011	66594	4825	Y-Bull Septic & Excavating, LLC	10002005	200.00
07/11	07/29/2011	66595	1	Watwood, Becky	10002005	100.28
	Grand Totals:					391,380.91

M = Manual Check, V = Void Check

BUILDING DEPARTMENT ACTIVITIES SUMMARY

For the Month of: July 2011

No.	Building	Permit Fee	Plan Check Fee	Surcharge	SDC's	Value Current Month	No. to Date	Total to Date	No. Last Yr	Total Last Year
0	Single Family Dwelling (SFD	$0.00	$0.00	$0.00	$0.00	$0.00	5	$1,357,866.65	5	$1,251,975.08
1	Single Family Addition (SFA	$439.70	$0.00	$52.76	$0.00	$68,410.00	12	$506,499.99	6	$245,869.55
0	Single Family Garage-Carport (SFG	$0.00	$0.00	$0.00	$0.00	$0.00	1	$24,464.00	1	$31,507.00
0	Two Family Residential (TFR	$0.00	$0.00	$0.00	$0.00	$0.00			0	$0.00
0	Multi-Family Residential Apts (MFR	$0.00	$0.00	$0.00	$0.00	$0.00			0	$0.00
0	Commercial New (C	$0.00	$0.00	$0.00	$0.00	$0.00			1	$8,318,600.00
0	Commercial Addition-Change (CA	$0.00	$0.00	$0.00	$0.00	$0.00	1	$155,536.00	0	$0.00
0	Churches (C	$0.00	$0.00	$0.00	$0.00	$0.00			0	$0.00
0	School Repair-Addition (S	$0.00	$0.00	$0.00	$0.00	$0.00			0	$0.00
0	Building Removal (B	$0.00	$0.00	$0.00	$0.00	$0.00	1		0	$0.00
4	Misc.-Retaining Wall-Fence (M,RW,F	$587.16	$467.19	$70.46	$0.00	$61,617.78	18	$345,332.76	31	$538,983.00
5	Total Building Permits	$1,026.86	$467.19	$123.22	$0.00	$130,027.78	36	$2,389,699.40	44	$10,384,934.63
2	Mechanical Permits	$45.80	$0.00	$5.50	N/A	N/A		N/A		N/A
9	Plumbing Permits	$428.40	N/A	$51.41		N/A		N/A		N/A
0	Mfg Home Install - Permit Fee	$0.00	N/A	$0.00	N/A	N/A		N/A		N/A
0	Mfg Home Install - Administrative Fee	$0.00	N/A	$0.00	N/A	N/A		N/A		N/A
16	TOTAL PERMITS	$1,501.08	$467.19	$180.13	$0.00	$130,027.78	36	$2,389,699.40	44	$10,384,934.63
	Total Year to Date Calculated Fees									

City of Brookings Building Division Permits

For the month of: July 2011

Permit #	Name	Address	EDU	Description	Type	Units	Value	Permit Fee	Plan Check	Plumb Fee	Mech Fee	Fines	Other Fees	Sys Dev Chg	Map and Tax Lot
B-11-38	Rosso	1115 Ransom Ave		SFA	2	1	68,410.00	439.70		47.60	25.00				4113-06BA-2401
P-11-10	Anderson	Seacrest Loop lot 47								47.60					4014-36A lot 47
P-11-09	Anderson	Seacrest Loop lot 46								47.60					4014-36A lot 46
P-11-08	Anderson	Seacrest Loop lot 45								47.60					4014-36A lot 45
P-11-07	Anderson	Seacrest Loop lot 44								47.60					4014-36A lot 44
P-11-06	Anderson	Seacrest Loop lot 43								47.60					4014-36A lot 43
P-11-05	Anderson	Seacrest Loop lot 42								47.60					4014-36A lot 42
P-11-04	Anderson	Seacrest Loop lot 41								47.60					4014-36A lot 41
P-11-03	Anderson	Seacrest Loop lot 40								47.60					4014-36A lot 40
B-11-38	17-C	825 Pioneer Road		M	11	1	24,000.00	213.85	224.54						4113-05BC-2900
B-11-41	Kessler	527 Spruce St		M	11	1	7,550.78	85.54	55.60						4113-05CB-5500
B-11-39	Theriault	1107 Rowland Ln		M	11	1	23,074.00	206.60	134.29						4113-06CA-1340
B-11-40	Bourdlarios	1106 Coral Ct		M	11	1	6,993.00	81.17	52.76						4113-06BA-2223
M-11-08	Frostad	530 Willow St									20.80				4113-05CB-2600
						Per Data Base	130,027.78	1,026.86	467.19	428.40	45.80				
						Per Worksheet	130,027.78	1,026.86	467.19	428.40	45.80				

Permit #	Name	Address	EDU	Description	Type	Units	Value	Permit Fee	Plan Check	Plumb Fee	Mech Fee	Sewer Fee	Water Service	Sys Dev Fee	MH Permit
						Per Data Base									
						Per Worksheet									
						Total Building & Manufactured Home Permits	130,027.78	1,026.86	467.19	428.40	45.80				

VAULT
8-8-11

STEP Collection System for the North Bank Chetco River Road Developments

2011

Orenco Systems, Inc.
814 Airway Avenue
Sutherlin, OR 97479

1 INTRODUCTION

1.1 Scope

This report will expand in detail on a wastewater collection alternative for the proposed Tribble Development, and others, along North Bank Chetco River Road (NBCRR), which is north and East of Highway 101 in Brookings. A Septic Tank Effluent Pumping (STEP) system will be the specific technology addressed in this report. The technology configuration, layout, hydraulic analysis, operation & maintenance and summary of costs will be discussed in this report. As the existing connection point from the new system is undetermined, options for layout will include two viable routes. Future capacity for development in the area will also be included in the options and cost.

1.2 Purpose

This report will discuss the STEP system technology in detail. As a proposed alternative for future development, the technology used should meet both the needs of the developer and the operating utility. This report will show that the STEP system is a viable option for all parties involved in the development area. This report is also a foundation for the design of the system, once approved.

1.3 Background

This report is in response to the proposed facility recommendations in the North Bank Chetco River Road Wastewater Feasibility Study (NBCRRWFS) by The Dyer Partnership for the development along NBCRR. The cost of the proposed traditional sewer for this area is excessive, and alternatives were researched.

The author of this report is employed by Orenco Systems Inc., which is also the possible provider of equipment for a STEP system. Orenco has provided equipment and design support for numerous STEP systems throughout the world for over 25 years. The technology has been proven, and advancements are continually being made to make a STEP system the ideal choice for sustainable collection systems.

1.4 Site

The Tribble Development sits along the Chetco river to the West and North Bank Road to the East. The proposed development is planned to add 59 Equivalent Dwelling Units (EDUs) to the existing municipal sewer system. Existing areas, the Chetco River Resort, Riverside RV and the Thompson Road area are also along NBCRR and could benefit from a new sewer connection in the area. The Tidewater development is also a potential site for future development along NBCRR, and is included in the immediate need sites for sewer capacity.

Future growth areas farther down NBCRR were considered as well. This report will include discussions on future capacity for these areas. It is not anticipated that these developments will happen any time in the near future.

2 STEP SYSTEM COMPONENTS

2.1 Typical On-Lot Installation

In a STEP system, every home or commercial facility has its own septic tank. These tanks act as part of the treatment process, and provide storage capacity for emergencies. Each tank houses a pump, all pumps working together to pressurize a common effluent line, which ties into the municipal sewer.

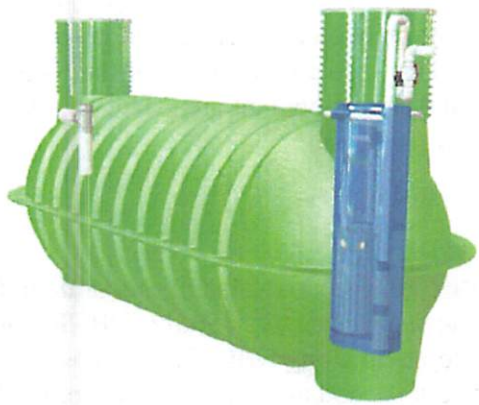


Figure 1. STEP Tank with Pump Vault

2.2 Interceptor Tanks

Raw sewage from the homes flows to a watertight underground tank, where primary treatment occurs via settling and natural biological processes. Solids remain in the tank, decreasing in volume through anaerobic digestion. Precast concrete or fiberglass tanks should have been designed by a registered engineer and approved by state or local regulatory agencies or authorities. To achieve effective performance and minimize pump-out occurrences, residential interceptor tanks should have a nominal liquid capacity of 1000 gallons for up to 3 bedrooms, 1500 gallons for 4 bedrooms, 2000 gallons for 5 bedrooms, and, for more than 4 bedrooms.

2.3 Pump Packages

Each tank houses a pump package, including a pump vault. The pump vault is suspended in the septic tank by Schedule 80 support pipes. The vault comes with a Biotube filter cartridge, float stem bracket, and support pipes. Each pump vault houses one (Simplex) High Head Effluent Pump, discharge assembly, Biotube filter cartridge, float switch assembly, and float stem bracket. These units are designed to take effluent from the tank and pump it into the force main.

For most single family home applications, an Orenco Systems®, Inc. Model PF100511, 1/2 hp, 115 VAC, single phase, 60 Hz, two-wire motor, with 10 foot long extra heavy duty (SO) electrical cord with ground will be used. These pumps are capable of delivering 18 GPM at a pressure of 14 ft, 10 GPM at 171 ft, and 0 GPM at 250 ft. When used in conjunction with a flow controller, the pump has capable of providing 5 gpm against a head of 190 feet. Pump are UL and CSA listed as an effluent pump. This pump is provided with a non-prorated five-year warranty. Larger horsepower units are available (3/4 to 1-1/2 hp, 230 VAC). Pump will have 24 hour run-dry capability, ability to repair the liquid end independently of the motor end (and vise-versa), and be designed to pass an 1/8" solid.

These pumps come with a 5-year warranty, with a typical life-cycle of 20 years. At any one time Orenco has 40,000 pumps under warranty.

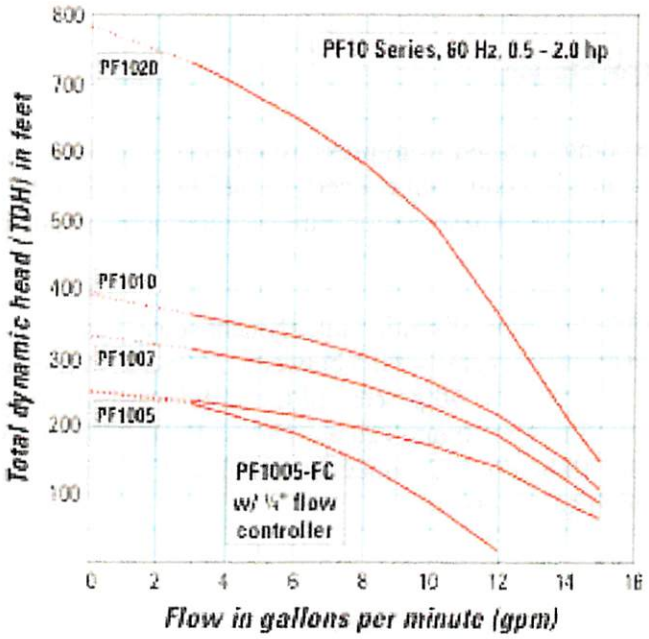


Figure 2. Pump Curve for Individual STEP

2.4 Control Panels

Each tank has its own control panel. Panels can be set up on timers, or on demand (more common). The panels run the pump in the tank, and provide feedback via the floats when there is a condition for alarm. All panels are configured with local alarms, or all alarms can be routed to the operator with panels that share a phone line with the home. Panels should be in clear site of the tank, mounted to independent posts, and not to the side of the homes.

2.5 Force Mains

Effluent transport will utilize small diameter pressure lines. These are typically buried three feet below grade. Though generally not required, isolation valves will be placed strategically to allow for easy maintenance or emergency repair of the lines. Instead of manholes the pressure lines utilize a pigging port system, which a pig is flushed through the system to clean debris. This is an uncommon procedure for STEP systems, as effluent in the lines does not create a buildup. Air release valves will also be placed at high points in the system to eliminate air pockets in the pressure sewer. Each air release will be installed in a carbon filter basin to keep odors from occurring.

2.6 Odor Control Station

Hydrogen Sulfide being released from pressure pipes (Pump Stations, STEP, Grinder) into concrete structures is a common concern for utilities, and can be addressed with the use of odor control stations. These stations are easy to maintain, and have low operating costs.

The dissolved sulfide in a typical septic tank effluent sewer system is generally about 5-10 mg/L and the pH range generally falls between 6.6 and 7.4 based on the testing of existing systems. At a pH of 7, 50 percent of the sulfides is H_2S and 50 percent is HS^-. Only the H_2S evolves into the air and causes odor and corrosion in gravity sewers. An odor control station will be used to reduce the amount of Hydrogen Sulfide making its way into the receiving gravity system.

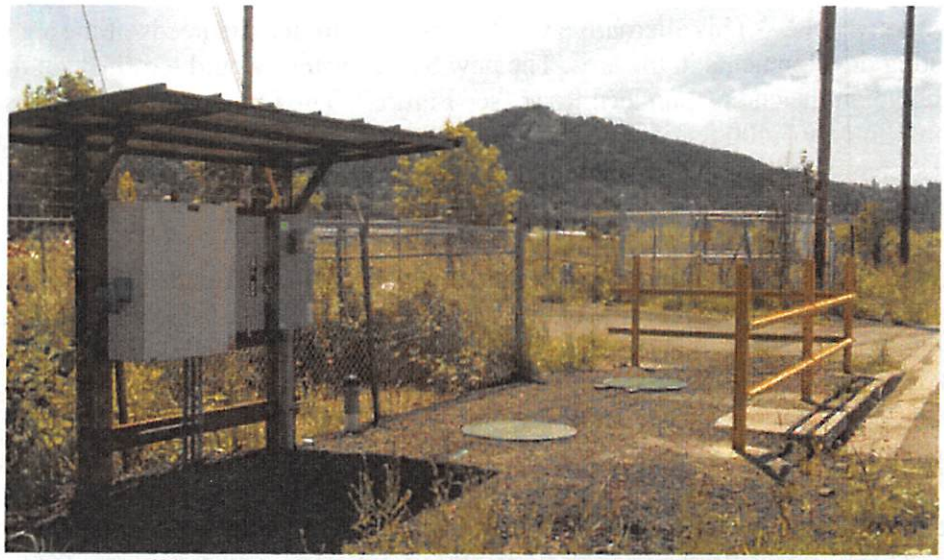


Figure 3. Odor Control Station in Sutherlin OR

Effluent flows from primary treatment tanks into a series of 1500 gallon aeration tanks. The effluent passes through a continuous working aeration unit in the tank. The unit allows the oxygen to be added so that the bacteria can consume free oxygen in the effluent. Once the treated effluent leaves the aeration station, it is safe for discharge into the existing gravity sewer. The station should be located within a few hundred feet of the discharge point.

3 STEP SYSTEM LAYOUT ALTERNATIVES

3.1 Discharge Locations to Existing Sewer System

Based on the various potential discharge locations to the existing system, described in the NBCRRWFS by The Dyer Partnership, two of these locations will be evaluated as the most feasible. The two locations include the "End of 8-inch sewer line located on Lundeen Road" as well as the "Oak Street/Chetco Avenue intersection". Alternatives for each location include short term flows from the Tribble Development, Tidewater Property, Chetco River Resort, Riverside RV, and Thompson Road Area.

The Lundeen Road location was chosen for a few reasons. The area allows for easy access to the existing manhole, there is space for the new aeration station, there is already an easement for a water line that runs up the hill from the North Bank Road to the end of Lundeen Road. This will provide a short route with little disturbance to existing roads in the area. Although the elevation for this location would be a problem for large pump stations, the effluent pumps in a STEP system would be able to pump to this location. Details on the hydraulics of the system will be shown in the Hydraulic analysis section.

Alternative #1A – This alternative would serve the immediate needs of the short term and existing developments in the area. The new STEP system would terminate at the existing manhole on the end of Lundeen Road (see Figure), The force main would consist of approximately 5,400 feet of 6", and 1,700 feet of 4" pressure mains. The hydraulics of this system would allow for the immediate need of 342 EDUs as well as an additional capacity for a future undetermined growth of 50–100 EDUs.

Alternative #1B - The capacity of the discharge point at the Lundeen Road location is limited due to the 8" lateral line running from Lundeen down to Oak Street. The total amount of capacity at this location, according to the NBCRRWFS, is 276 gpm, or 522 EDUs. To allow the ability to utilize the full capacity of this location, the line sizes for the STEP system would be as follows: 5,400 feet of 8", and 1,700 feet of 6"line. This would allow for the immediate need of 342 EDUs with extra capacity of 180 EDUs.

The other discharge point considered is a connection to the interceptor at Chetco and Oak. This route would require a mainline through private property, under the bridge and along Chetco Road. This route allows more flexibility for hydraulic capacity, as the elevation at connection is not as high. The main issue with this discharge point is that it may be difficult to put an aeration station near enough to the discharge point. This will have to be further evaluated.

Alternative #2A – This alternate route will include running a mainline through the properties along NBCRR. The line size for this option will meet the immediate need of 342 EDU's as well as an additional capacity of 100-200 EDUs. This includes 2,800 feet of 6" line, and 4,500 feet of 4" line.

Alternate #2B – This route includes the mainline as in Alternate #2A, but is sized to utilize the maximum capacity available at the connection of Chetco and Oak. According to the NBCRRWFS, the maximum capacity at this connection point is 1062 EDUs. This will allow for the immediate need of 342 EDUs as well as an additional capacity of 720 EDUs. This option includes approximately 7,300 feet of 8" mainline.

3.2 Flow Rates

Empirical data was collected from various existing pressure sewer systems and is shown on the following chart:

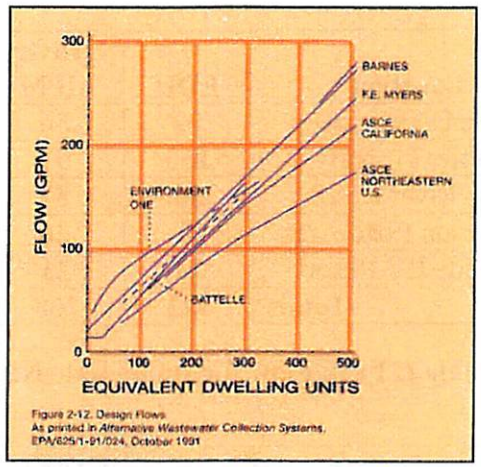


Figure 4. Empirical Data from Various Pressure Collection Systems

From this data a simple linear equation can be developed to predict design flows in pressure sewer systems:

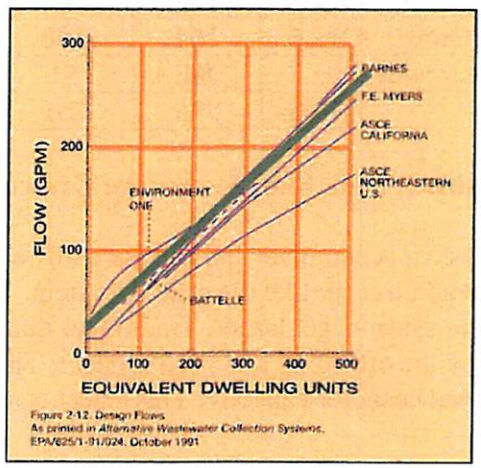


Figure 5. Simplified Equation Line

$$Q_p = \frac{EDU}{2} + D$$

Where:

Q_p is the peak flow in gpm and EDU is the equivalent number of dwelling units. D may range from 0 to 20 depending on the pumps used.

Utilizing this method to determine peak flows for the various service areas the following table was generated:

Location	EDU	Gravity GPM	STEP GPM
Tribble Development	59	36	45
Tidewater Property	150	91	90
Chetco River Resort	56	34	43
Thompson Road Area	43	26	37
Riverside RV Resort	34	21	32
Totals	**342**	**208**	**186**

Table 1. Peak Flow for Immediate Need Areas

Location	EDU	Gravity GPM	STEP GPM
Future Growth Area 1	102	62	66
Future Growth Area 2	116	71	73
Future Growth Area 3	150	91	90
Future Growth Area 4	122	74	76
Future Growth Area 5	168	102	99
Future Growth Area 6	164	100	97
Future Growth Area 7	84	51	57
Totals	**906**	**551**	**468**

Table 2. Peak Flow for Future Growth Areas

Since the tanks in the system accumulate and release at different times, the flows for STEP in Table 2 are not additive, unlike the gravity system. The STEP system works well to modulate flows as systems get larger. Traditional diurnal flows for gravity systems are dampened by the effects of the STEP system. This results in a flexibility of design, along with reduced costs for capacity. This effect can be more pronounced with the use of timers.

3.3 Hydraulic Analysis

Hydraulic calculations were completed for the four optional routes. The documents are included in Appendix B. The extra capacity in the lines is based on reasonable assumptions for future growth, including consistent elevation and residential flow. Line sizes may be further evaluated to accommodate specific growth areas.

3.4 Existing Utilities

The location of existing utilities, especially water lines may cause issues with design. The included cost estimates assume reasonable efforts to maintain the minimum distances from existing water lines. Other utilities such as gas, electricity, cable, etc... will have to be evaluated as well. A marked utility location request should be submitted during design. Existing utilities have more of a negative impact on gravity sewers. STEP system mains can easily be relocated to avoid existing utilities at little or no cost.

4 OPERATION AND MAINTENANCE

4.1 On-Lot Tanks

Managing a STEP system may seem like a risky endeavor, since there is learning curve involved. But with a proper plan, support from outside sources, and a good design, a STEP system can be a vital resource for a utilities looking for solutions.

Operation and maintenance cost for the STEP system are outlined in Appendix D. The City of Brookings will be responsible for the operation and maintenance of the individual on-site tanks as well as the mainline and aeration station. City staff may elect to provide this service, or there is also the option of contracting out the work to experienced service providers.

To keep costs low, not only is it important to purchase and install high-quality equipment, it is also important to standardize on an equipment package so that operators can stock and carry a limited number of items that are designed to work together.

Typically, a preventive maintenance program includes periodic servicing of the following on-lot components:

- Measuring the sludge/scum in the tank
- Cleaning the pump and its surrounding effluent filter or screen
- Verifying the operation of the floats and control panel

Typically, these preventive maintenance visits are conducted once every 3-5 years.

Reactive maintenance is directly affected by the amount of proactive maintenance performed. This includes alarm callouts for floats, pump failures, clogged filters, etc...

In general it can be expected that there will be about 2.5 hours/ 100 connections a month of reactive maintenance with a good proactive maintenance program.

Not unlike proactive and reactive protocols, tank pumping costs and mandated frequencies vary widely. Based on an 8-year audit of watertight tanks in Glide, Oregon, and a 5-year audit in Montesano, Washington, Orenco established reliable pump-out intervals for households with various sizes of tanks and number of occupants, as shown in Figure 6.

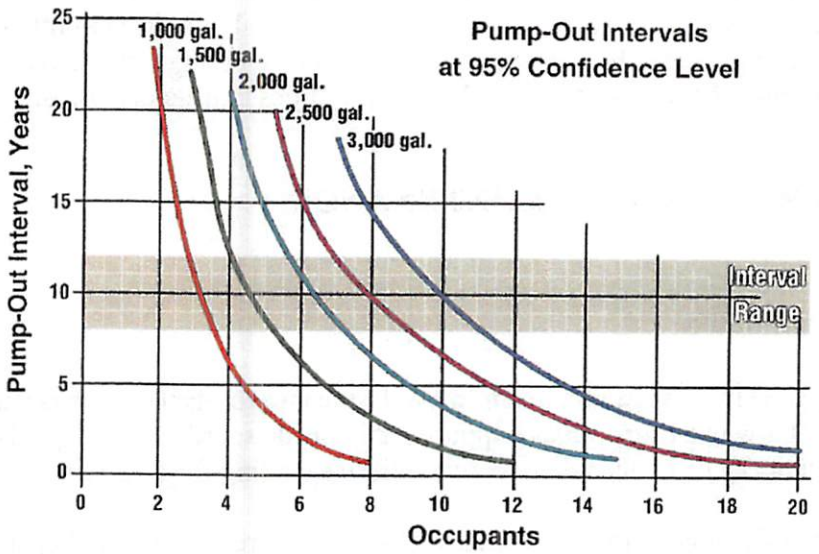


Figure 6. Interceptor Tank Pump-Out Intervals

4.2 Force Mains

Force mains are designed with Cleanouts, Air release valves and isolation valves to assist in operations. In general, there are not many O&M activities for STEP mains.

Cleanouts – Since the system is pressurized, cleaning involves allowing a bullet shaped "pig" to scour the lines incase cleaning is necessary. The access for these pigs is on the end of the lines, called cleanouts, and the pigs are caught again at the discharge point once the line has been cleaned. Pigging of lines is not a scheduled event, since STEP system effluent does not accumulate on the interior pipe walls.

Pigging Ports – If there are significant line changes (>1") in the system, pigging ports will be installed to catch and release different sized pigs. This is not a scheduled event.

Air Release Valves - These valves are included in areas where air may accumulate in the pressure line. Air in the lines may cause air binding, or cavitations in lines, and needs to be purged for proper performance. These valves should be exercised on an annual basis, and checked for odor issues routinely. It is not expected that there will be any air release

valves for this project, since the entire pressure main is below the static effluent elevation (the line will remain full).

Isolation Valves - The operator or utility should be familiar with the locations of these valves. Incase of a line break, these valves can isolate parts of the system for repair work.

4.3 Sulfide Control

The odor control station can be designed with venturi aspirators (Figure 7), which introduce oxygen into the incoming effluent. Low horsepower pumps run the aerators on a timer, with minimal cost in energy. An annual inspection of this system includes checking the pumps and exercising valves. Testing of the STEP effluent before discharge into the gravity system can be done at this point to ensure compliant hydrogen sulfide concentrations.

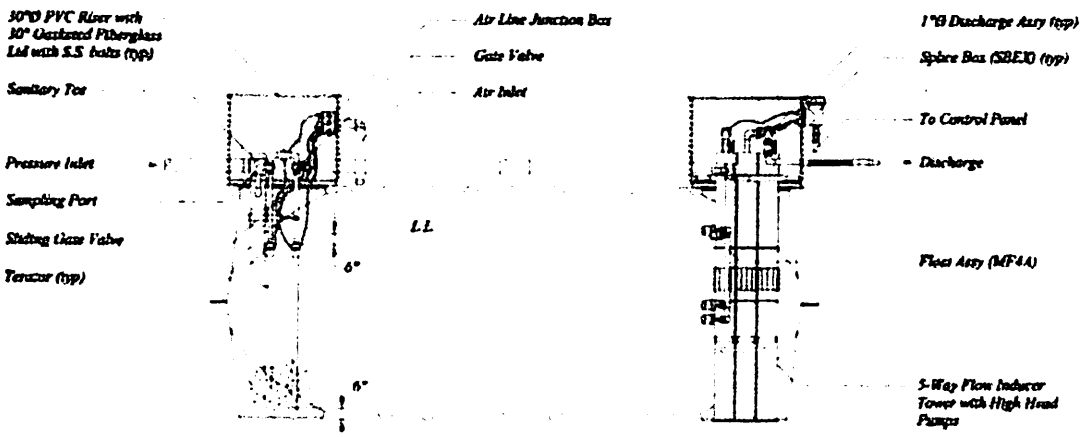


Figure 7. Example of Odor Control Station

These stations typically require approximately 200 sq ft (10'x20') for every 10,000 gpd treated. Multiple stations can be put in series and phased for expansion. Systems can be designed in a wide variety of configurations to meet space needs. Minimum retention time is needed to maintain the dissolved oxygen level in the discharge lines following the aeration station, so these should be located close to the discharge point.

5 SUMMARY

5.1 Recommendations

It is recommended that a STEP system be installed for the new and existing developments along NBCRR. For the new developments, individual on-lot tanks and equipment can be installed as the dwelling units are installed. This means a deferred cost for developers and current residences. Typical on-lot installation costs range between $5,000 - $6,000 per EDU for new installations including laterals and service connections. The Riverside RV Resort and Chetco River Resort may be able to utilize existing tanks with some modifications.

For the mainline, the cost estimates for the various options are included in Appendix C. The options are summarized in Table 3.

Route	Mainline Cost	Capacity (EDUs)
Alternate #1A	**$213,270.00**	342
Alternate #1B	**$295,570.00**	522
Alternate #2A	**$203,020.00**	342
Alternate #2B	**$377,540.00**	1064

Table 3. Mainline Cost Summary

Alternate #1B and #2B would provide the maximum capacity for the discharge points. Since it is difficult to predict what growth will be like in the proposed areas, these alternatives may not be necessary. Alternate #1A and #2A are more feasible since they allow for the immediate need in the area, as well as limited future needs. Alternate #2A allows more flexibility for future growth, as well as less cost for the current needs.

When comparing these alternatives to traditional gravity, or other pressure sewer alternatives for collection, there are major advantages to a STEP system. These differences in technology are outlined in Appendix E. The STEP systems are emerging as a highly cost effective and sustainable collection technology that is allowing growth in areas which otherwise could not be developed.

5.2 Oregon STEP Systems

STEP systems are widely used throughout Oregon and are a common alternative to traditional collection systems. The first STEP system was installed in Glide about 25 years ago. Since then a number of STEP systems have been installed throughout the State. The Oregon DEQ has developed standards for the design of these systems, and often recommend these systems for different areas.

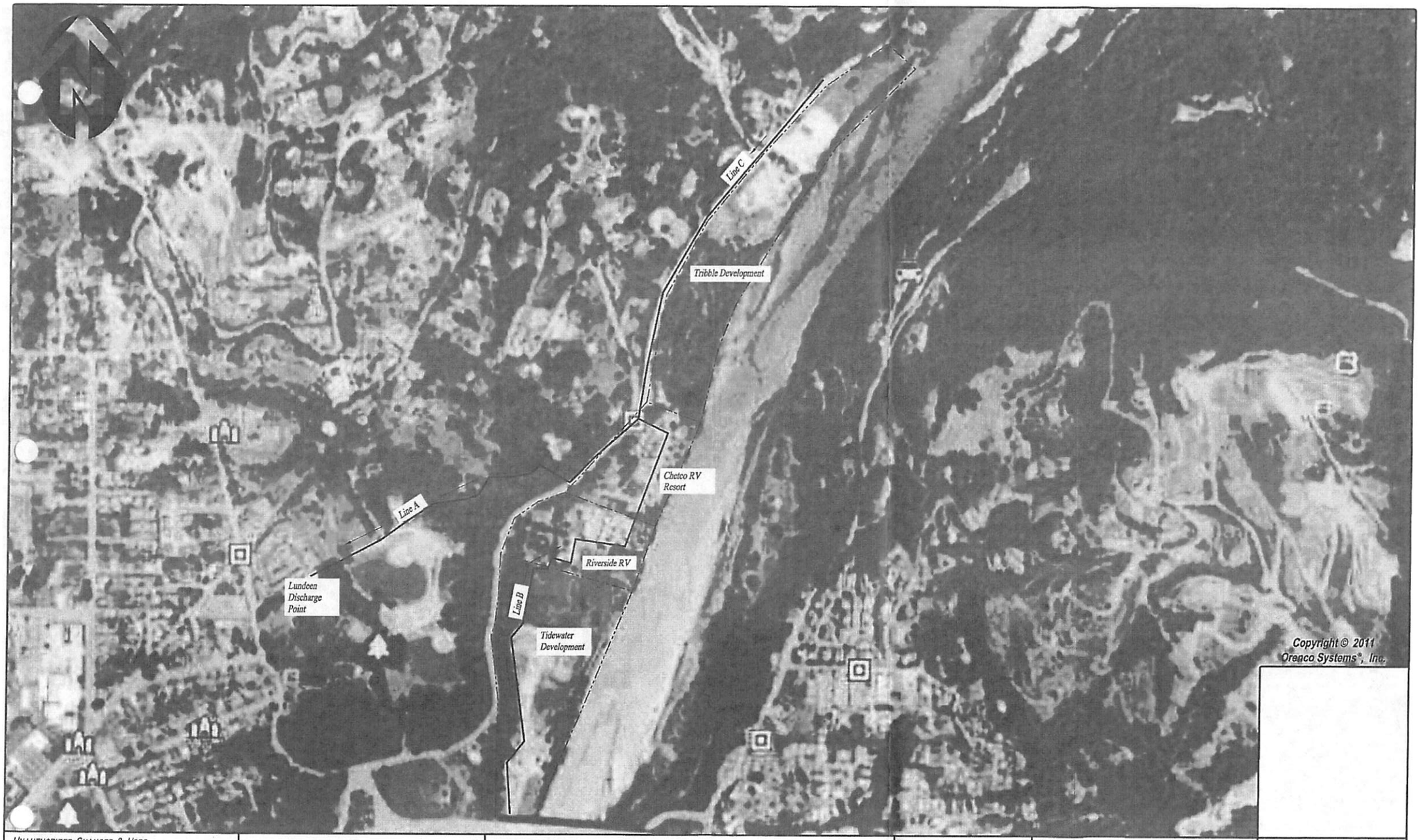
The Cities utilizing Orenco STEP equipment have continuous support and training through Orenco Systems, Inc. for the life of the system. This allows the Utility to access information and develop new operators during the duration of the system. It is recommended that existing operators be contacted to establish an understanding of how these systems are managed.

5.3 References

There are a number of existing communities that utilize these types of systems, and more references are available upon request.

Dick Price	Steven's County PUD	WA	509-233-2534
Buck Cole	Diamond Lake Sewer	WA	509-447-4660
Kevin Hegel	City of Montesano	WA	360-589-1141
Scott Monroe	SW Barry County	MI	269-207-5324
Floyd Wildman	City of Starbuck	WA	509-399-2373
Tim White	Swinomish	WA	360-466-7223
Fred Jack	Bethel Heights	AR	479-751-7481
Linda Higgins	City of Elkton	OR	541-584-2547
Roger Dickenson	City of Lacey	WA	360-491-5644
Braxton Platt	Southern Alabama Utilities	AL	251-649-4316
Pat Brook	City of Missoula	MT	406-523-4881

APPENDIX A



UNAUTHORIZED CHANGES & USES

The engineer preparing these plans will not be responsible or liable for unauthorized changes to or uses of these plans. All changes to these plans must be in writing and must be approved by the preparer of these plans.

UTILITY NOTIFICATION

Prior to construction the contractor shall call underground service alert for underground clearance. One-Call will provide information about, or locate, and mark underground facilities.

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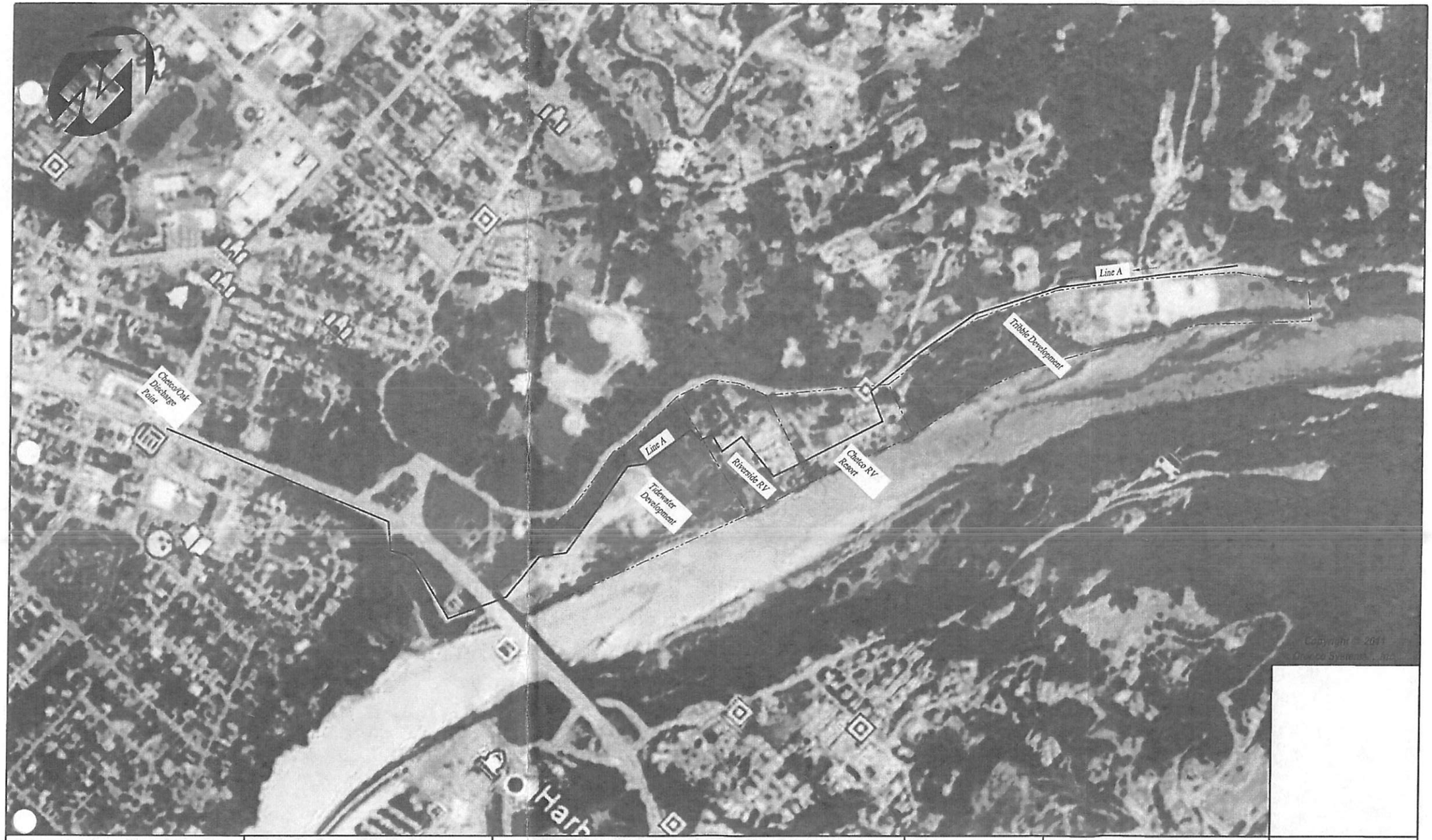
Changing the Way the World Does Wastewater®

Drawn By: CSJ	Project: Brookings STEP Alternate #1	Scale: 1" = 500'-0"	
Drawn For: RON TRIBBLE		Sheet: 1 OF 1	
	Title: Plan View	Rev: 1.0	Date: 6/15/11



UNAUTHORIZED CHANGES & USES

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UTILITY NOTIFICATION

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Drawn By: CSJ	Project: Brookings STEP Alternate #2	Scale: 1" = 500'-0"	
Drawn For: RON TRIBBLE		Sheet: 1 OF 1	
	Title: Plan View	Rev: 1.0	Date: 6/15/11

APPENDIX B

Headloss Calculation Sheet
Brookings, OR

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1-800-348-9843

Pipe Class/Sch:	Sch. 40
C Value:	150
Population Density:	3

Line Section	Starting STA.	End STA.	Line Length		# EDU	Peak Flowrate		Line Size (Nom)		Head Loss		Velocity	
	feet	feet	feet	meters		gal/min	liters /sec	inches	millimeters	feet	meters	ft/sec	m/sec
A1a	22 + 88	0 + 00	2283.0	697.4	342	186.0	11.73	4"	≈100 mm	40.7 feet	12.42 meters	4.7 ft/sec	1.43 meters
								5"	≈125 mm	13.6 feet	4.13 meters	3.0 ft/sec	0.91 meters
								6"	≈150 mm	5.5 feet	1.69 meters	2.1 ft/sec	0.63 meters
								8"	≈200 mm	1.5 feet	0.44 meters	1.2 ft/sec	0.36 meters
B1a	31 + 02	0 + 00	3102.0	945.5	240	135.0	8.52	4"	≈100 mm	30.5 feet	9.31 meters	3.4 ft/sec	1.04 meters
								5"	≈125 mm	10.2 feet	3.10 meters	2.2 ft/sec	0.66 meters
								6"	≈150 mm	4.2 feet	1.27 meters	1.5 ft/sec	0.46 meters
								8"	≈200 mm	1.1 feet	0.33 meters	0.9 ft/sec	0.26 meters
C1a	17 + 38	0 + 00	1738.0	529.7	102	66.0	4.16	4"	≈100 mm	4.6 feet	1.39 meters	1.7 ft/sec	0.51 meters
								5"	≈125 mm	1.5 feet	0.46 meters	1.1 ft/sec	0.32 meters
								6"	≈150 mm	0.6 feet	0.19 meters	0.7 ft/sec	0.22 meters
								8"	≈200 mm	0.2 feet	0.05 meters	0.4 ft/sec	0.13 meters
A1b	22 + 88	0 + 00	2288.0	697.4	522	276.0	17.41	4"	≈100 mm	84.6 feet	25.77 meters	7.0 ft/sec	2.12 meters
								5"	≈125 mm	28.1 feet	8.57 meters	4.4 ft/sec	1.35 meters
								6"	≈150 mm	11.5 feet	3.50 meters	3.1 ft/sec	0.93 meters
								8"	≈200 mm	3.0 feet	0.92 meters	1.8 ft/sec	0.54 meters
B1b	31 + 02	0 + 00	3102.0	945.5	240	135.0	8.52	4"	≈100 mm	30.5 feet	9.31 meters	3.4 ft/sec	1.04 meters
								5"	≈125 mm	10.2 feet	3.10 meters	2.2 ft/sec	0.66 meters
								6"	≈150 mm	4.2 feet	1.27 meters	1.5 ft/sec	0.46 meters
								8"	≈200 mm	1.1 feet	0.33 meters	0.9 ft/sec	0.26 meters
C1b	17 + 38	0 + 00	1738.0	529.7	382	206.0	13.00	4"	≈100 mm	37.4 feet	11.40 meters	5.2 ft/sec	1.58 meters
								5"	≈125 mm	12.4 feet	3.79 meters	3.3 ft/sec	1.01 meters
								6"	≈150 mm	5.1 feet	1.55 meters	2.3 ft/sec	0.70 meters
								8"	≈200 mm	1.3 feet	0.41 meters	1.3 ft/sec	0.40 meters
A2a(1)	27 + 72	0 + 00	2772.0	844.9	342	186.0	11.73	4"	≈100 mm	49.4 feet	15.05 meters	4.7 ft/sec	1.43 meters
								5"	≈125 mm	16.4 feet	5.01 meters	3.0 ft/sec	0.91 meters
								6"	≈150 mm	6.7 feet	2.05 meters	2.1 ft/sec	0.63 meters
								8"	≈200 mm	1.8 feet	0.54 meters	1.2 ft/sec	0.36 meters
A2a(2)	43 + 86	27 + 72	1614.0	491.9	192	111.0	7.00	4"	≈100 mm	11.1 feet	3.37 meters	2.8 ft/sec	0.85 meters
								5"	≈125 mm	3.7 feet	1.12 meters	1.8 ft/sec	0.54 meters
								6"	≈150 mm	1.5 feet	0.46 meters	1.2 ft/sec	0.38 meters
								8"	≈200 mm	0.4 feet	0.12 meters	0.7 ft/sec	0.22 meters
A2a(3)	53 + 82	43 + 86	996.0	303.6	158	94.0	5.93	4"	≈100 mm	5.0 feet	1.53 meters	2.4 ft/sec	0.72 meters
								5"	≈125 mm	1.7 feet	0.51 meters	1.5 ft/sec	0.46 meters
								6"	≈150 mm	0.7 feet	0.21 meters	1.0 ft/sec	0.32 meters
								8"	≈200 mm	0.2 feet	0.05 meters	0.6 ft/sec	0.18 meters

Headloss Calculation Sheet
Brookings, OR

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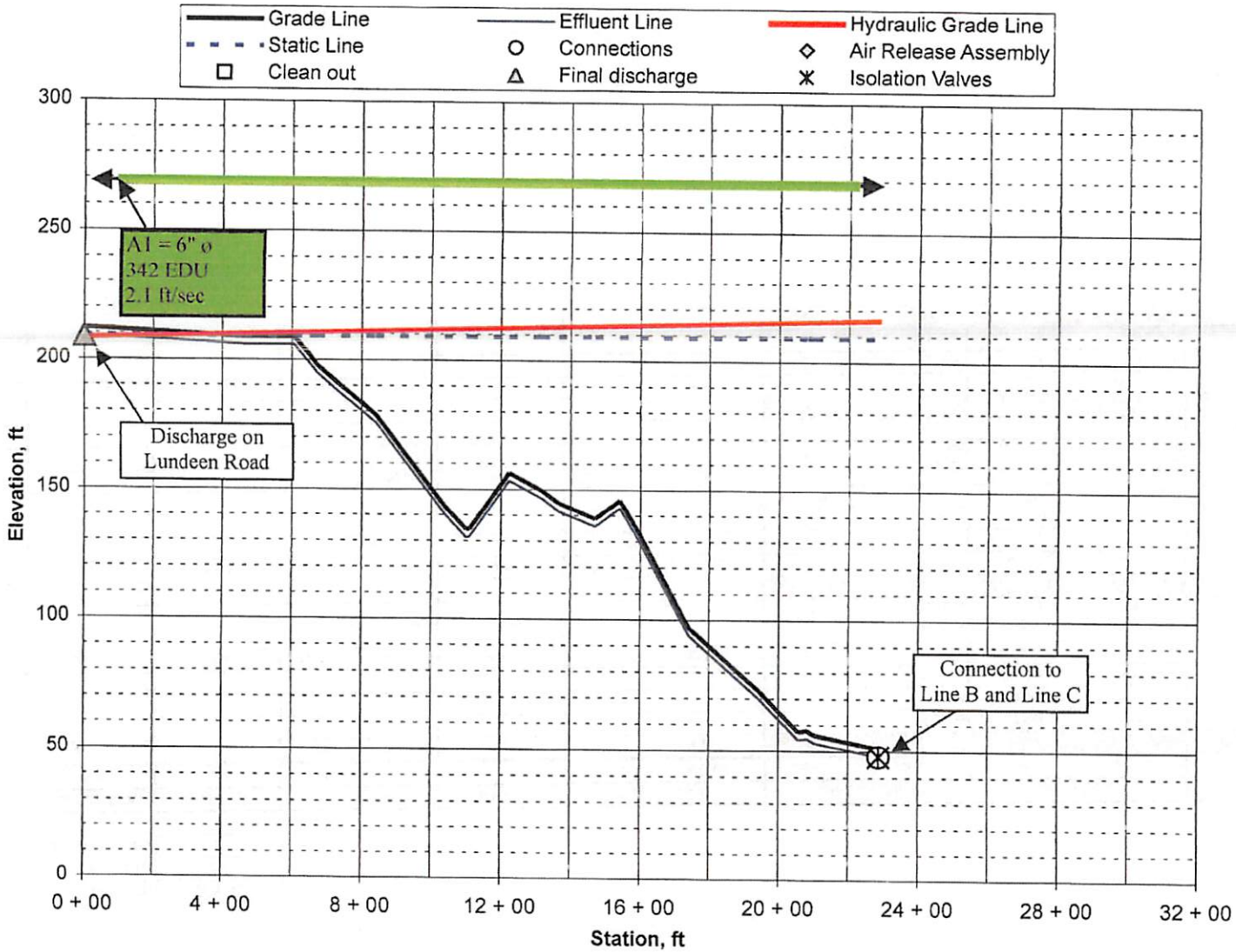
Pipe Class/Sch:	Sch. 40
C Value:	150
Population Density:	3

Line Section	Starting STA.	End STA.	Line Length		# EDU	Peak Flowrate		Line Size (Nom)		Head Loss		Velocity	
	feet	feet	feet	meters		gal/min	liters /sec	inches	millimeters	feet	meters	ft/sec	m/sec
A2a(4)	73 + 10	53 + 82	1928.0	587.7	102	66.0	4.16	4"	≈100 mm	5.1 feet	1.54 meters	1.7 ft/sec	0.51 meters
								5"	≈125 mm	1.7 feet	0.51 meters	1.1 ft/sec	0.32 meters
								6"	≈150 mm	0.7 feet	0.21 meters	0.7 ft/sec	0.22 meters
								8"	≈200 mm	0.2 feet	0.05 meters	0.4 ft/sec	0.13 meters
A2b(1)	27 + 72	0 + 00	2772.0	844.9	1062	546.0	34.45	4"	≈100 mm	361.9 feet	110.32 meters	13.8 ft/sec	4.20 meters
								5"	≈125 mm	120.4 feet	36.70 meters	8.8 ft/sec	2.67 meters
								6"	≈150 mm	49.2 feet	15.00 meters	6.1 ft/sec	1.85 meters
								8"	≈200 mm	12.9 feet	3.94 meters	3.5 ft/sec	1.07 meters
A2b(2)	43 + 86	27 + 72	1614.0	491.9	912	471.0	29.72	4"	≈100 mm	160.3 feet	48.87 meters	11.9 ft/sec	3.62 meters
								5"	≈125 mm	53.3 feet	16.26 meters	7.6 ft/sec	2.30 meters
								6"	≈150 mm	21.8 feet	6.64 meters	5.2 ft/sec	1.59 meters
								8"	≈200 mm	5.7 feet	1.74 meters	3.0 ft/sec	0.92 meters
A2b(2)	53 + 82	43 + 86	996.0	303.6	878	454.0	28.64	4"	≈100 mm	92.4 feet	28.18 meters	11.4 ft/sec	3.49 meters
								5"	≈125 mm	30.7 feet	9.37 meters	7.3 ft/sec	2.22 meters
								6"	≈150 mm	12.6 feet	3.83 meters	5.0 ft/sec	1.54 meters
								8"	≈200 mm	3.3 feet	1.01 meters	2.9 ft/sec	0.89 meters
A2b(2)	73 + 10	53 + 82	1928.0	587.7	822	426.0	26.88	4"	≈100 mm	159.1 feet	48.48 meters	10.7 ft/sec	3.27 meters
								5"	≈125 mm	52.9 feet	16.13 meters	6.8 ft/sec	2.08 meters
								6"	≈150 mm	21.6 feet	6.59 meters	4.7 ft/sec	1.44 meters
								8"	≈200 mm	5.7 feet	1.73 meters	2.7 ft/sec	0.83 meters

Brookings STEP, OR
Line A1



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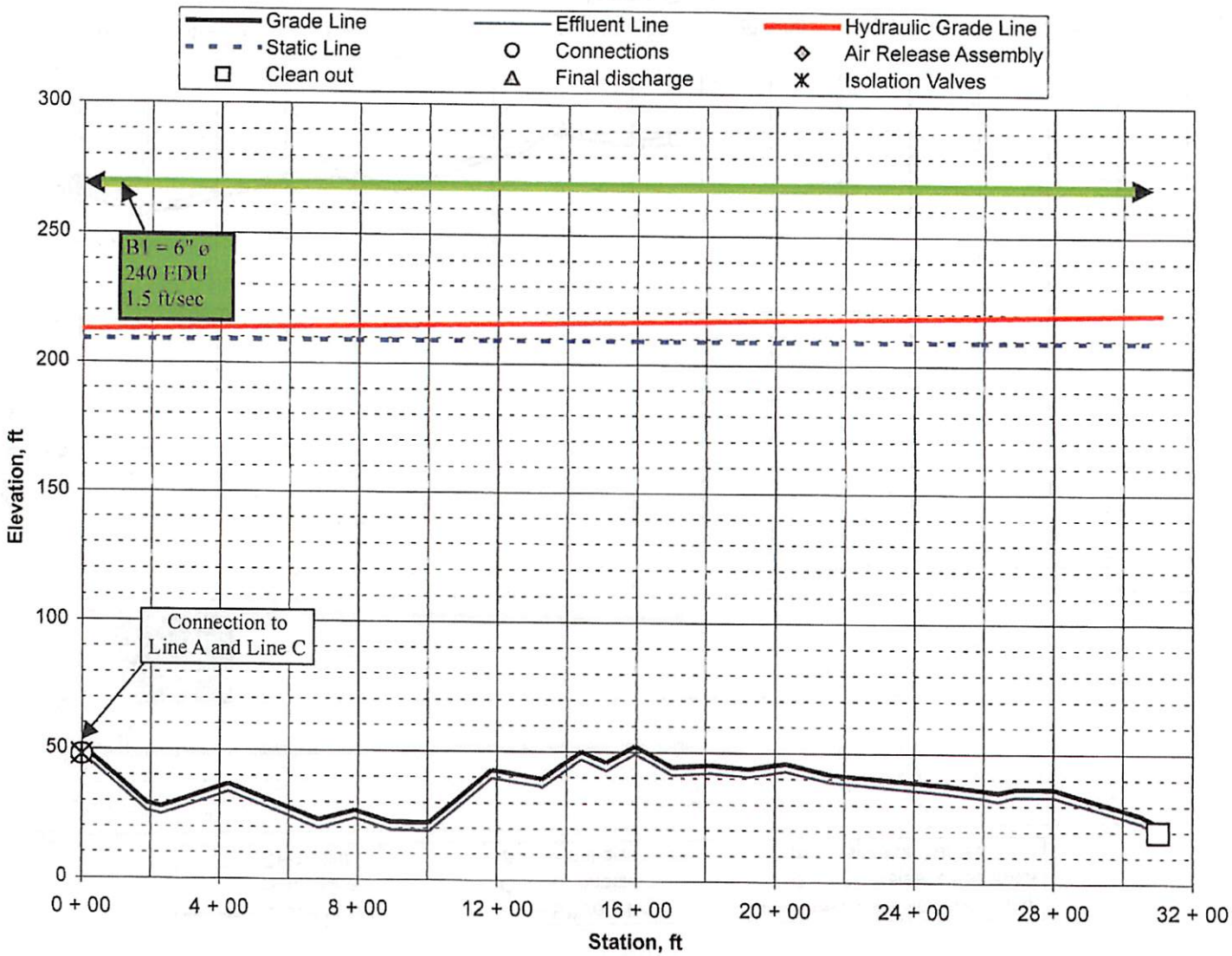
Line B1



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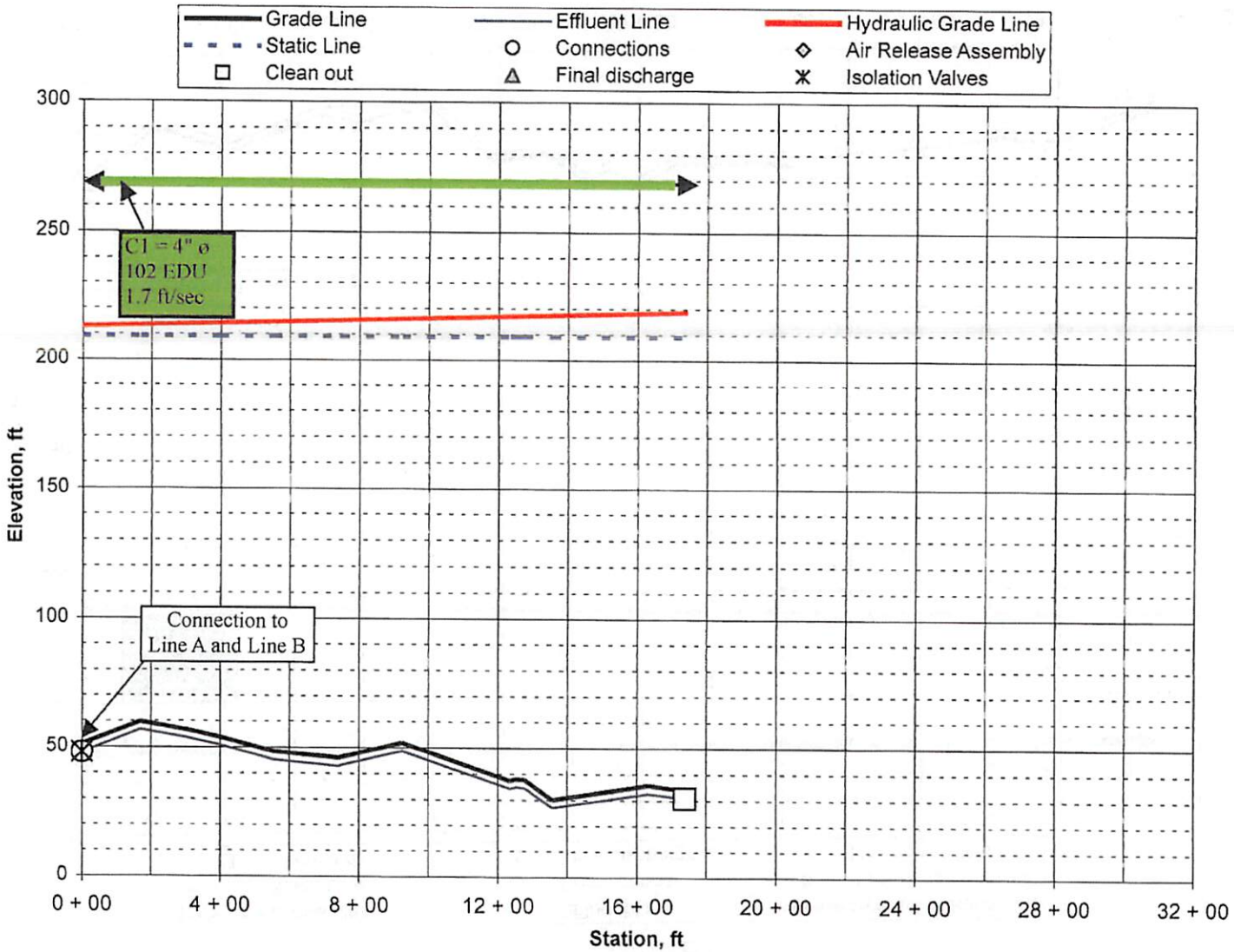

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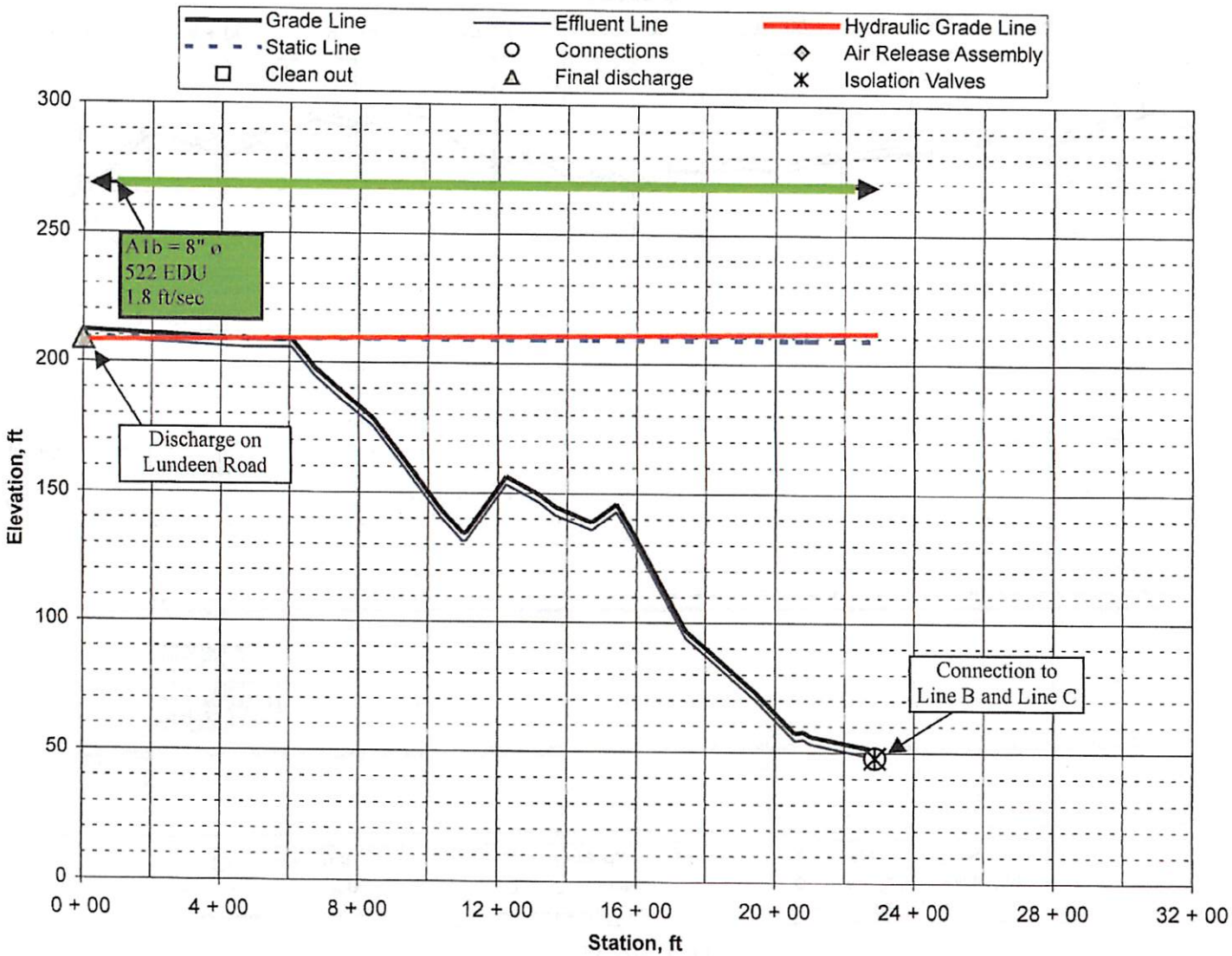

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Brookings STEP, OR
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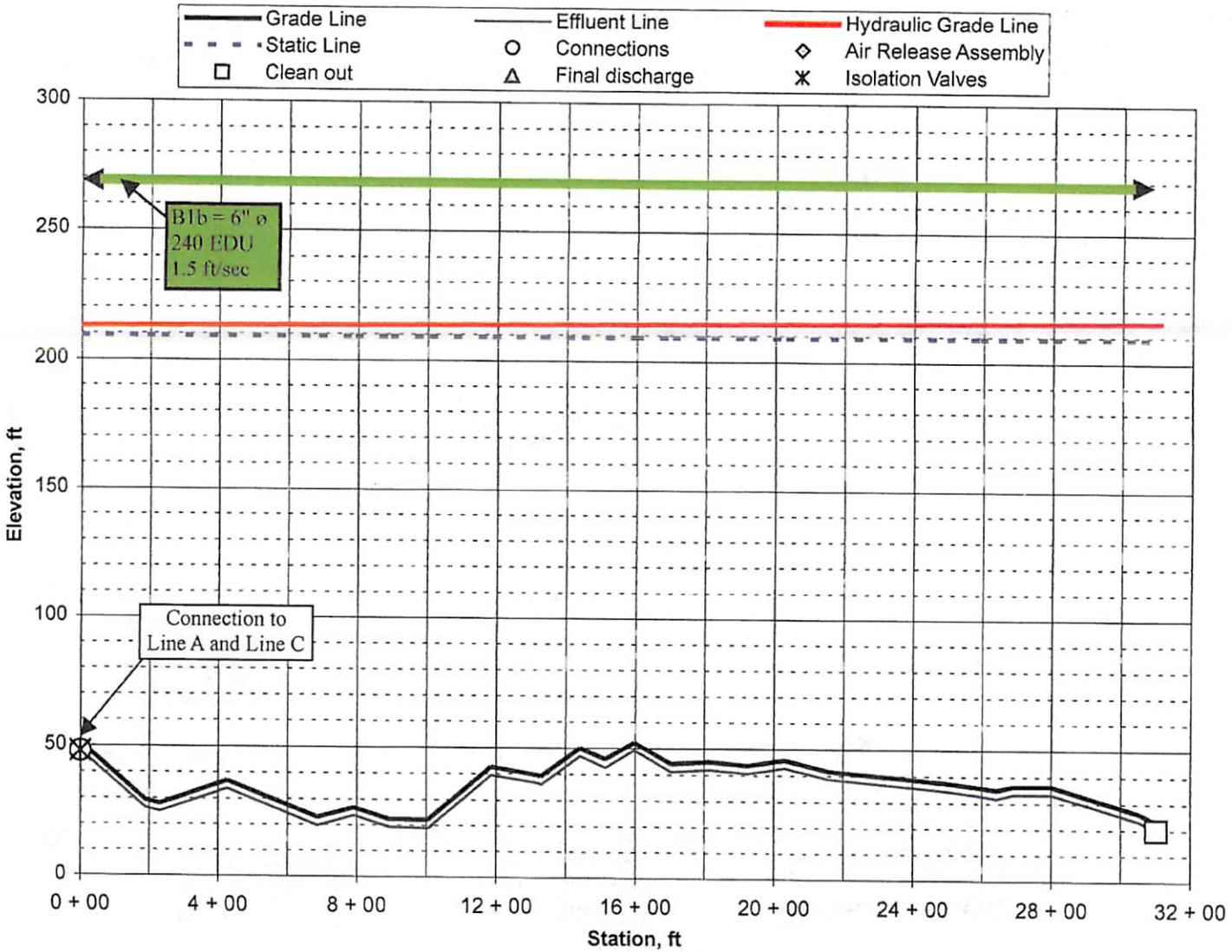

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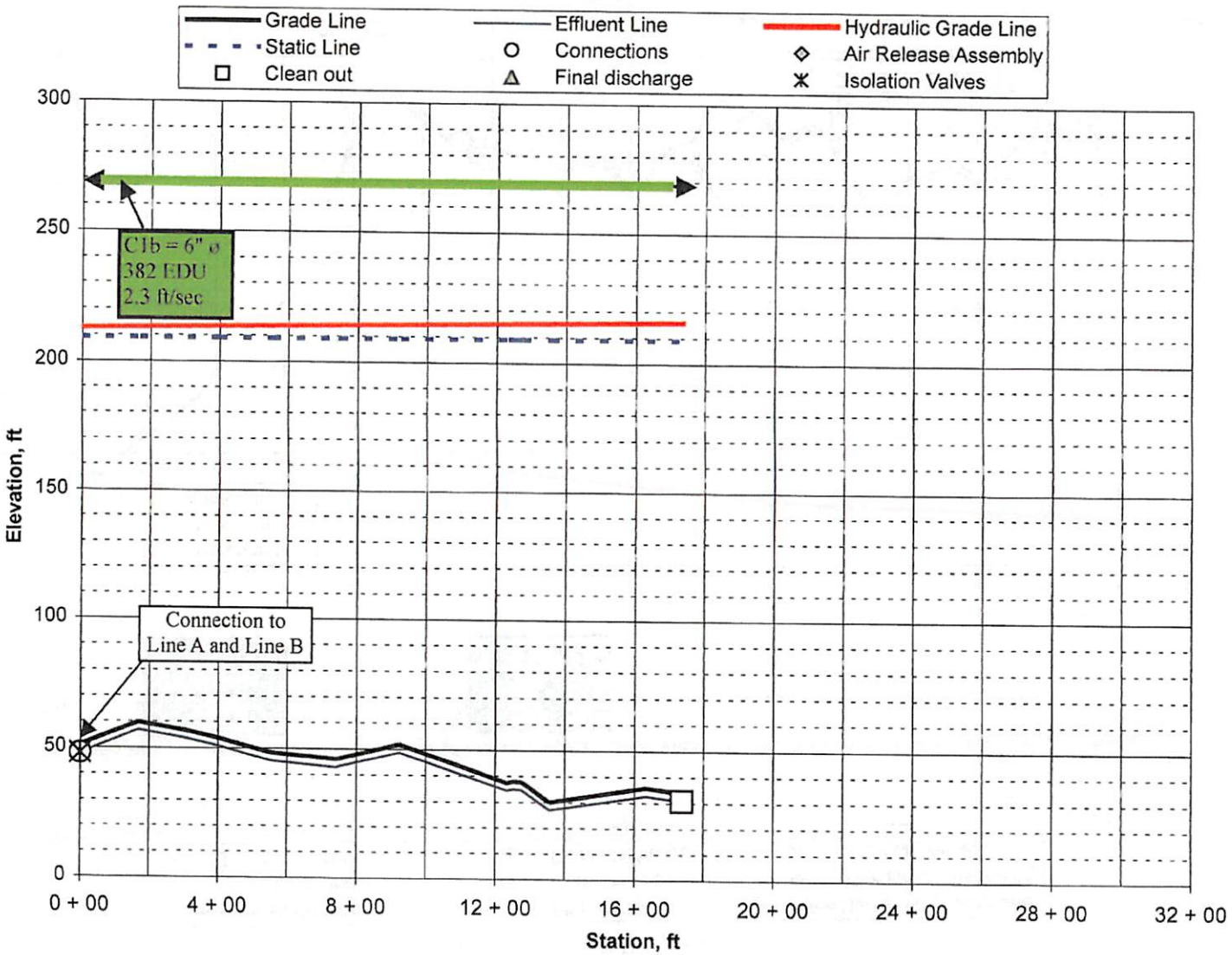
Brookings STEP, OR
Line C1b



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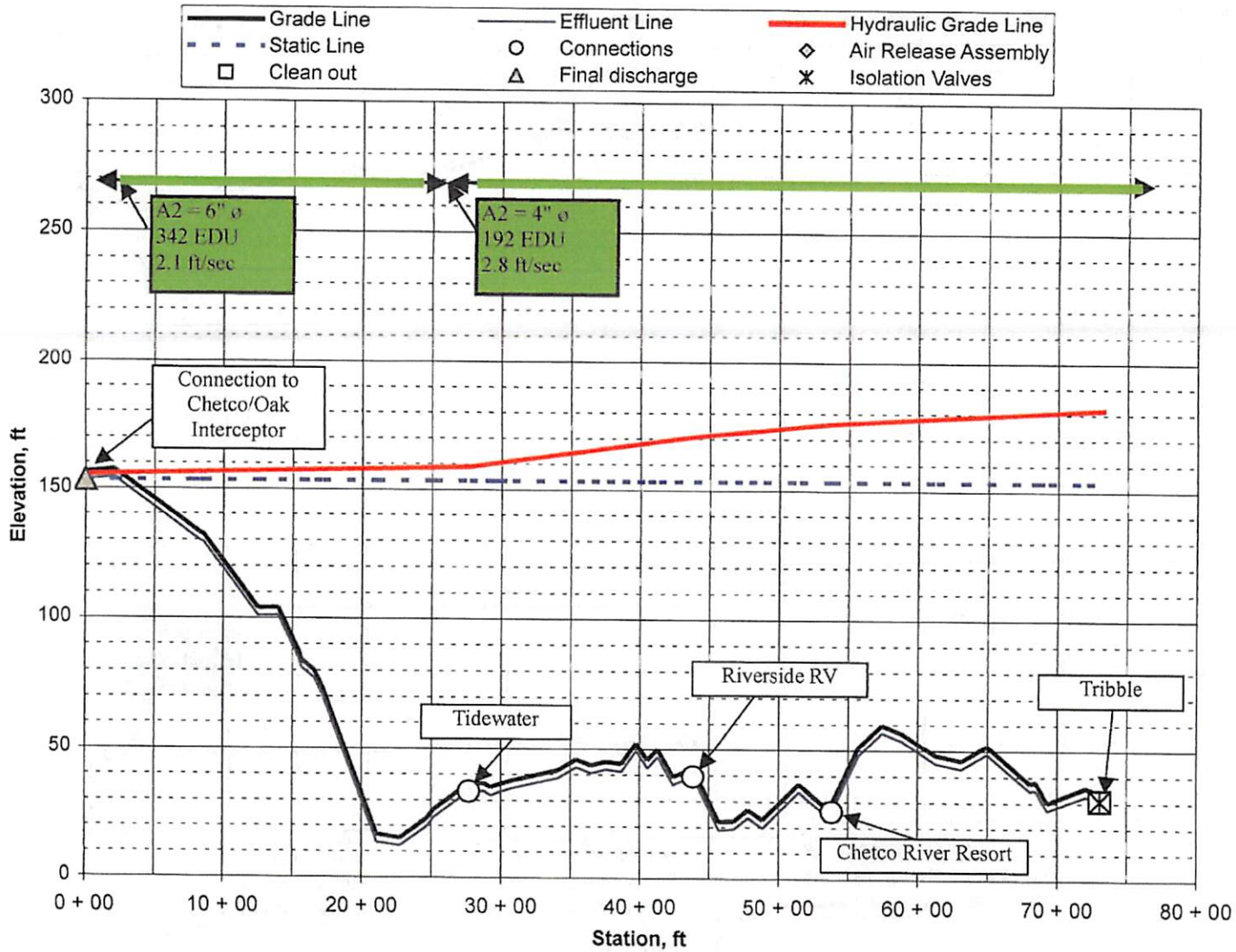

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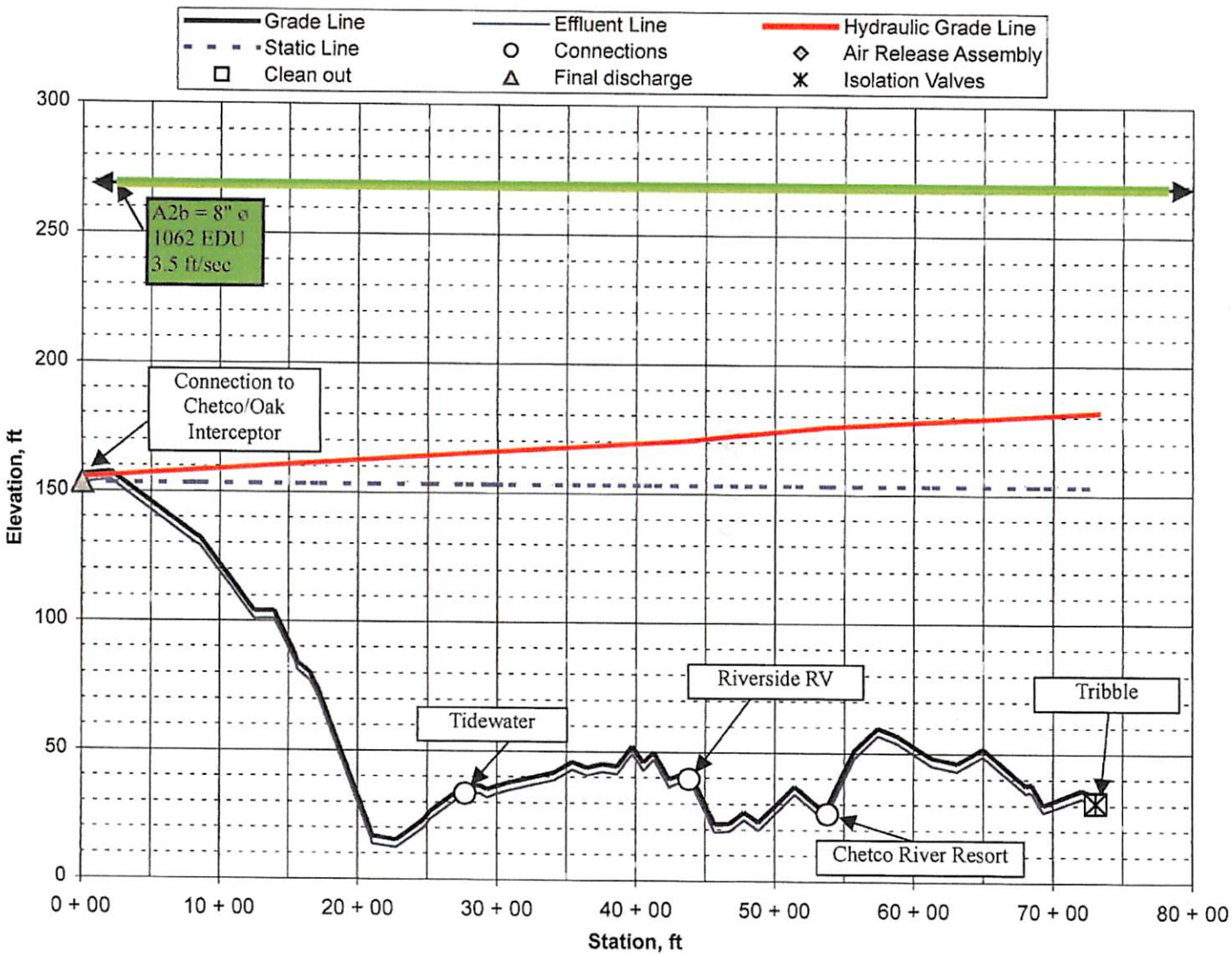
Line A2b



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APPENDIX C

Cost Estimates

Alternative 1A

Collection System				
Mainline[1]	***Qty***	***Units***	***Cost/Unit***	***Subtotal***
4" diameter	1700	LF	$20.00	$34,000.00
6" diameter	5400	LF	$25.00	$135,000.00
8" diameter		LF	$35.00	$
Pigging Port				
Pig Port Assembly	1	EA	$400.00	$400.00
Isolation Valve				
Valve and Enclosure	5	EA	$450.00	$2,250.00
Clean Out				
Clean Out Assembly	2	EA	$350.00	$700.00
Odor Control Station				
Aeration Tank and Equipment	186	gpm	$220.00	$40,920.00
			Construction Total	**$213,270.00**

Alternative 1B

Collection System				
Mainline[1]	***Qty***	***Units***	***Cost/Unit***	***Subtotal***
4" diameter	0	LF	$20.00	$-
6" diameter	1700	LF	$25.00	$42,500.00
8" diameter	5400	LF	$35.00	$189,000.00
Pigging Port				
Pig Port Assembly	1	EA	$400.00	$400.00
Isolation Valve				
Valve and Enclosure	5	EA	$450.00	$2,250.00
Clean Out				
Clean Out Assembly	2	EA	$350.00	$700.00
Odor Control Station				
Aeration Tank and Equipment	276	gpm	$220.00	$60,720.00
			Construction Total	**$295,570.00**

Alternative 2A

Collection System				
Mainline[1]	*Qty*	*Units*	*Cost/Unit*	*Subtotal*
4" diameter	4500	LF	$20.00	$90,000.00
6" diameter	2800	LF	$25.00	$70,000.00
8" diameter	0	LF	$35.00	$
Pigging Port				
Pig Port Assembly	1	EA	$400.00	$400.00
Isolation Valve				
Valve and Enclosure	3	EA	$450.00	$1,350.00
Clean Out				
Clean Out Assembly	1	EA	$350.00	$350.00
Odor Control Station				
Aeration Tank and Equipment	186	gpm	$220.00	$40,920.00
			Construction Total	**$203,020.00**

Alternative 2B

Collection System				
Mainline[1]	*Qty*	*Units*	*Cost/Unit*	*Subtotal*
4" diameter	0	LF	$20.00	$
6" diameter	0	LF	$25.00	$
8" diameter	7300	LF	$35.00	$255,500.00
Pigging Port				
Pig Port Assembly	0	EA	$400.00	$
Isolation Valve				
Valve and Enclosure	3	EA	$450.00	$1,350.00
Clean Out				
Clean Out Assembly	1	EA	$350.00	$350.00
Odor Control Station				
Aeration Tank and Equipment	547	gpm	$220.00	$120,340.00
			Construction Total	**$377,540.00**

APPENDIX D

Technology Fact Sheet

Orenco® Effluent Sewer Systems: Operational Cost – On-lot Components

Orenco Systems® Incorporated
800-348-9843

Executive Summary

Communities that want to build or improve their wastewater infrastructure soon discover that more than one type of sewer system is available. When researching, bidding, and selecting a sewer system, community leaders and their consulting engineers often focus on up-front capital costs. Decision-makers will make a more financially sustainable decision if they evaluate all the costs of any given technology — up-front costs but also ongoing O&M costs (operation and maintenance) and future R&R costs (equipment repair and replacement). That's because these "life cycle" costs differ greatly by technology.

Community decision-makers need this complete cost picture for two reasons: 1) to make a fair cost comparison, before a technology is selected and buried underground, and 2) to establish a rate structure for citizens that will fully fund all system costs, after the system is operational.

Orenco's engineers have spent more than three decades researching, designing, manufacturing, and supporting the installation and maintenance of Orenco® Effluent Sewer Systems (also known as STEP systems or pressure sewers). Hundreds of communities throughout North America and around the world have selected Orenco Effluent Sewers for their wastewater needs. Not only are effluent sewer capital costs frequently lower than those for gravity sewers, O&M and R&R costs are lower as well. This position was first taken by the US Environmental Protection Agency in 1997.[1] And it was reiterated by the EPA again this year, in a March 2009 article surveying multiple effluent sewer systems in Alabama, Tennessee, and Georgia. According to the EPA's Robert Freeman and Joyce Hudson, effluent sewer systems in Mobile, Alabama (for example)"...have provided savings of 25% to 50% over centralized collection and treatment."[2]

In fact, based on the documented performance of thousands of households, the operational costs for an Orenco® Effluent Sewer total about $10/month/residence.[3]

This Technology Fact Sheet explains the basis for that figure.

O&M and R&R costs for Orenco Effluent Sewers fall into four main categories. These categories and costs are summarized in Table 1:

Table 1. Orenco® Effluent Sewer O&M and R&R Costs

I.	Proactive Maintenance (PM)	$ 1.67/month/residence
II.	Reactive Maintenance (RM)	$ 1.00/month/residence
III.	Equipment Repair & Replacement (R&R)	$ 4.00/month/residence
IV.	Tank Pumping	$ 3.33/month/residence
	TOTAL	**$ 10.00/month/residence**

Each of these cost categories is described in greater detail in this Fact Sheet, beginning with a general overview of effluent sewer O&M requirements.

[1] *Response to Congress on Use of Decentralized Wastewater Treatment Systems*, USEPA, April 1997, pp. 13-14, and *Orenco Effluent Sewers: Cost-Effective Environmentally Sound Wastewater Collection System*, Orenco Systems®, Inc., "A Fraction of the Cost of Conventional Sewers," p. 4.

[2] Freeman, Robert, and Hudson, Joyce, "Small, Green, and Useful," *Water Environment & Technology*, March, 2009, p. 68.

[3] These costs are consistent with those reported by Kevin White, Ph.D., P.E., in his article titled "Decentralized Wastewater Cluster Management: Operation and Maintenance Experience and Costs," published in *WEFTEC 2005 Proceedings* by the Water Environment Federation.

Orenco Effluent Sewer Systems: On-lot Operational Costs (cont.)

Overview: Effluent Sewer O&M Requirements

Operation and maintenance of effluent sewers is relatively simple and, for most small communities, only requires a part-time operator and inexpensive equipment and tools.

Operation and maintenance of the mainlines for an effluent sewer system is, by and large, insignificant. Occassionally, the operator services or exercises the mainline valves, including air release valves. If the system includes odor control filters, these are periodically replaced. While it's possible to pig or flush the mains in an Orenco effluent sewer, it's rarely necessary. Also, breaks or leaks from collection mains are rare and very inexpensive to repair.

Most of the operator's time will be allocated to maintaining the on-lot part of the system: e.g., periodic checking and cleaning of the STEP (Septic Tank Effluent Pumping) components inside each property's on-lot tank. These include filters or screens, the pump, floats, controls, etc. Due to the number of components and products in the on-lot part of effluent sewers, the quality of the equipment purchased by system managers and operators has a profound impact on the overall cost of the system.

It is imperative to purchase and install reliable, durable equipment. Failure to do so will negatively affect operation and maintenance requirements and therefore greatly increase O&M and R&R costs.

According to Mike Saunders, an expert in asset management of wastewater systems, "a single technician with a pick-up truck" can maintain 2,000 STEP connections in an effluent sewer systems, as long as the system was correctly installed with high-quality products. Now working for Orenco Systems, Saunders previously served nearly 10 years as a Utility Engineer and Technical Services Manager for Charlotte County, Florida, and was responsible for coordinating and planning a system that included 360 miles of gravity sewer lines, 200 miles of force mains, 250 miles of effluent sewer lines, more than 6,000 STEP connections, and 300 lift stations.

To keep costs low, not only is it important to purchase and install high-quality equipment, it is also important to standardize on an equipment package so that operators can stock and carry a limited number of items that are designed to work together.

Following is additional information on the four main categories of O&M and R&R costs for effluent sewers systems.

Pro-Active Maintenance (PM) = $1.67/month/residence

Preventive maintenance (PM) protocols vary widely between systems, which is one reason why system operators and their utilities report widely different O&M costs.

Typically, a PM program includes periodic servicing of the following on-lot components:

- Measuring the sludge/scum in the tank
- Cleaning the pump and its surrounding effluent filter or screen
- Verifying the operation of the floats and control panel

Some utilities have elected to operate their effluent sewers with little or no PM. In a 2009 article titled "O&M Considerations for STEP Systems,"[4] Saunders notes that this approach can yield low PM costs in the early years but "major repairs and replacement activities will escalate as the system suffers from neglect." This increases reactive maintenance (RM) requirements and total operational costs.

Conversely, some utilities have elected to operate effluent sewers with highly aggressive — even excessive — PM schedules. This, says Saunders, can also "result in higher overall O&M costs when PM activities unnecessarily target components that have a significant level of reliability with less frequent PM." Saunders concludes, "The most cost-efficient STEP management approaches balance PM and RM to achieve the lowest overall cost for O&M."

Specifically, that means scheduling PM activities every 3-5 years. Conservatively estimating 1.5 hours per service visit at $40/hour, that comes to $60/visit over 36 months or a PM cost of $1.67/month/residence.

Bethel Heights, Arkansas, (www.bethelheightsark.org) has an Orenco Effluent Sewer that is managed with a good balance of PM and RM protocols to maintain its on-lot components.

[4] Saunders, Mike, "O&M Considerations for STEP Systems," *Water Environment and Technology*, March, 2009, p. 24.

Orenco Effluent Sewer Systems: On-lot Operational Costs (cont.)

II. Reactive Maintenance (RM) = $1.00/month/residence

As noted in the previous section, Reactive Maintenance (RM) is affected by Preventive Maintenance (PM) schedules. However, to arrive at a "typical" RM cost, Orenco has gathered RM data from 10 Orenco Effluent Sewer Systems, totaling more than 2,700 connections, and compiled it into Table 2, below.

As you can see, these systems average 1.4 hours/month of RM per 100 EDUs. Even conservatively estimating 2.5 hours/month/100 EDUs, that comes to $100/100 EDUs or an RM cost of $1.00/month/residence – assuming a typical business-hour labor rate of $40/hr. (We can apply a non-overtime labor rate because tanks have sufficient reserve capacity to allow operators to handle after-hours calls during the next business day.)

Table 2. Residential Service Call-Out Requirement per 100 Connections.

State	Community	EDUs	Screened	Hrs. / mo. / 100 EDUs
CA	Mt. Lake Estate	8	yes	1.0
CA	Villa Verona	337	yes	2.5
MT	Missoula	350	yes	1.5
OR	Elkton	135	yes	0.7
OR	Glide	700	20%	2.0
OR	Lake Side	51	yes	0.3
OR	La Pine	215	yes	1.8
OR	Tangent	180	yes	2.5
WA	Boston Harbor	166	yes	1.6
WA	Conconnully	75	yes	0.5
WA	Diamond Lake	525	yes	1.2
				Average Annual 1.4

III. Equipment Repair & Replacement (R&R) = $4/month/residence

Equipment Repair & Replacement (R&R) costs for effluent sewers consist primarily of R&R costs for pumps, floats, and various other miscellaneous components, with pumps contributing most of the cost. *These costs are low when the proper pump is used.* A high-quality multi-stage effluent pump should have run-dry capability, a UL listing, a continuous operation rating, and a 3-5 year warranty. Additionally, the pump should be corrosion-resistant and rebuildable, either by replacement of individual components or by replacement of either the liquid-end or the motor-end. Such a high-quality pump will provide, on average, more than 20 years of service.

Note that, of the four cost factors in operating effluent sewers, R&R costs are the largest. And these costs are directly related to equipment quality.

Poor quality equipment decisions almost always require frequent and costly R&R schedules and thus significantly contribute to overall operational costs.

To arrive at a typical monthly R&R cost, Orenco gathered actual costs from a number of Orenco Effluent Sewer systems and compiled it into Table 3, below. As you can see, R&R averages only $4/month/residence, partly because Orenco's pumps are small (10 GPM, ½ HP, 115 VAC) and relatively inexpensive.

In reality, however, costs may be even lower, since pump R&R assumes complete replacement of the pump every 20 years at approximately $600 per event (materials plus labor). Orenco Effluent Pumps are repairable, however, and repair costs are often half as much as replacement costs. At the Orenco Effluent Sewer System in Yelm, Washington, which includes 1,700 pumps, only 28 have been replaced since 1994.[5]

Table 3. Orenco Effluent Sewer Repair and Replacement Schedule

Component	Frequency	Cost/Event (Materials + Labor)	Amortized w/o Interest
Pump Replacement	20 years	$600	$2.50/month
Float Replacement	10 years	$100	$0.83/month
Misc. Component R&R	10 years	$75	$0.63/month
			Total: ~$4.00/month/residence

[5] Yelm, Washington Case Study, "Low Life Cycle Costs Keep Rates Low," Orenco Systems®, Inc., October 2009 (NCS-7).

Orenco Effluent Sewer Systems: On-lot Operational Costs (cont.)

IV. Tank Pumping = $3.33/month/residence

Not unlike PM and RM protocols, tank pumping costs and mandated frequencies vary widely. Based on an 8-year audit of watertight tanks in Glide, Oregon, and a 5-year audit in Montesano, Washington, Orenco established reliable pump-out intervals for households with various sizes of tanks and number of occupants, as shown in Figure 1[6].

Assuming a 1,000 gallon tank and 2, 3, and 4 people per residence, Orenco projects a pump-out interval of ~ 21 years, ~ 11 years, and ~7 years, respectively. These figures (calculated at a 95% level of confidence) are for watertight tanks, which are required in an Orenco Effluent Sewer system.

Conservatively estimating a pump-out fee of $400 and a 10-year frequency, the cost comes to $3.33/month/connection. At the more typical pump-out fees of $200 or $300 per event, the cost/month/connection is reduced to $1.67 and $2.50, respectively.

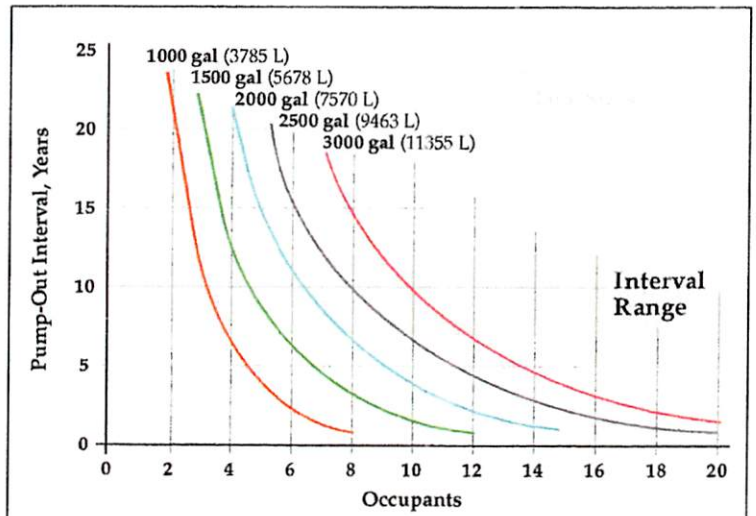


Figure 1. Pump-Out Intervals at 95% Level of Confidence

A Comment About Low Power Costs and Low Treatment Costs

The four O&M/R&R cost categories described above are the costs assumed by the utility and therefore must be calculated into rates. Please note that there are no power costs. Power costs for Orenco Effluent Sewer systems are minimal. It costs little more than $1.50 per month to run each household's on-lot pump[7] — and that negligible cost is part of each household's monthly electric bill, so doesn't need to be factored into utility rates.

Orenco Effluent Sewer systems also provide primary treatment, reducing solids by about 80%. Therefore, they are often followed by downsized and less costly secondary treatment facilities, such as a media filter, constructed wetland, or lagoon.[8]

Low power and treatment costs are one reason why Orenco Effluent Sewers are not just an affordable technology; they are an environmentally sustainable one.

In Conclusion

Clearly, when evaluating and selecting a sewer system, community engineers and decision-makers should ask for and then evaluate all costs — up-front capital costs, ongoing O&M costs, and recurring R&R costs — to make a financially supportable decision. Get real life data to validate all manufacturers' claims. And, if possible, visit, tour, and acquire data from sewer systems that have been operational for several years, preferably longer than ten. Contact manufacturers or your regulatory authorities to find a system close to you.

For more information on Orenco Effluent Sewers, call Orenco Systems®, Inc., 800-348-9843.

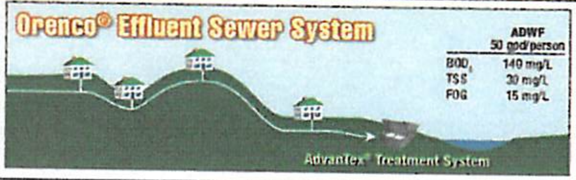
[6] Bounds, T.R., PE, "Septic Tank Septage Pumping Intervals," pp. 7-13 (NTP-TNK-TRB-1).

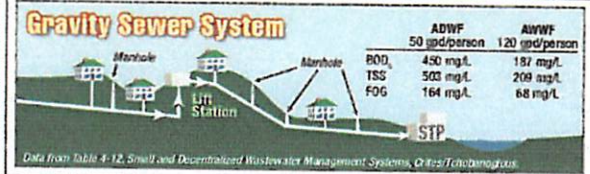
[7] Run Time = 20 min/day, VAC = 115, A = 12.7, National Average Power Cost = $0.1/kWh

[8] See descriptions of secondary treatment facilities for Mobile, Alabama and Lake City, Michigan in "Affordable Wastewater Solutions that Fit Your Community," Orenco Systems®, Inc., June 2008 (ACS-SMALLCOMM-1).

APPENDIX E

Sewer Comparison Chart: Three Common Sewer Options & Related Costs





		Orenco® Effluent Sewer System	Gravity Sewer System	Grinder Sewer System
On-Lot Components & Features	1	Performs primary treatment/sedimentation, allowing smaller downstream treatment facility	Performs no primary treatment; full waste stream with I/I is conveyed to larger treatment facility	Performs no primary treatment; full waste stream is conveyed to larger treatment facility
	2	**Costs $3,000-$5,000** in materials/installation for pump, septic tank, controls, excavation, and connection to network[1]	**Costs $1,800-$2,700** in materials/installation to install building sewer and connect to sewer main[1]	**Costs $4,800-$7,200** in materials/installation to install pump, pump basin, controls, excavation, and connection to network[1]
	3	Requires 1000-gal. tank per 3 bdr residence, 1500-gal. tank per 4 bdr residence	Requires 4-in. diameter service lateral at a constant slope to the mainline (see item #11)	Requires 50- to 150-gal. on-lot pump basin
	4	No need for immediate operator response in emergencies due to 24-hr emergency storage (> 200 gal.) provided by on-lot tank	Immediate operator response required when sanitary sewers back-up into homes/businesses	Immediate operator response required in emergencies due to lack of emergency storage provided by on-lot pump basin
	5	Caustic chemicals and other system abuses can be easily identified and controlled	Caustic chemicals, other system abuses, and on-lot I/I (the main source of I/I problems in gravity sewers) are very difficult to identify and control	Caustic chemicals and other system abuses can sometimes be identified and controlled
	6	$5.24/mo/EDU in annual on-lot O&M[2] (pump R&R and solids management)	$1.33-$2/mo/EDU in annual on-lot O&M[1] (clean building sewer)	$10-$24/mo/EDU in annual on-lot O&M[1,3] (pump R&R)
	7	Low on-lot electricity costs: < $1.50/mo/EDU to operate pump	No on-lot electricity costs unless lift pump required	High on-lot electricity costs: > $2.50/mo/EDU to operate pump; many homes require costly upgrades for 230 VAC power
	8	Uses lightweight (~ 30 lb), 115 VAC, ½ hp, 10-gpm pumps, with 250 ft of head capability		Uses heavy (100+ lb), 230 VAC, 1½–2 hp pumps with 150 ft of head capability
	9	Sometimes accommodates gravity (STEG) connections where terrain & hydraulics allow	Generally accommodates gravity connections but sometimes lift pumps are required	Always requires a pump connection
	10	Easily avoids conflicts with other utility services, at little or no cost, particularly with directional boring	Often conflicts with existing utility services, requiring costly change orders and redesigns	Easily avoids conflicts with other utility services, at little or no cost, particularly with directional boring
	11	Allows inexpensive, shallowly-buried, small-diameter (1-in.) service lateral for STEP, 1¼-in. diameter service lateral for STEG	Requires more costly 4-in. diameter service lateral, sometimes deeply excavated to 20-30 ft	Allows inexpensive, small-diameter (1¼-in.) service lateral
	12	Typically funded by state or federal funding programs	Typically funded by the homeowner, not by state or federal funding programs	Typically funded by state or federal funding programs
Mainlines	13	Uses small-diameter force mains, typically 2-in. diameter for small communities	Uses 8-in. diameter (or larger) mainlines	Uses small-diameter force mains, typically 2-in. diameter for small communities; mainline size is critical: excessive head loss if too small, frequent pigging due to low scouring velocities if too large
	14	**Costs $340,000-$510,000** in materials/installation for 50,000 gpd or 200 homes[1]	**Costs $2,182,000-$3,273,000** in materials/installation for 50,000 gpd or 200 homes[1]	**Costs $344,000-$516,000** in materials/installation for 50,000 gpd or 200 homes[1]
	15	Force mains follow the contour of the land and are installed in shallow (below frost depth), narrow trenches that go in quickly with limited disruption to the community	Mainlines must be laid to grade, requiring excavations as deep as 20-40 ft; deep & wide trenches go in slowly with significant disruption to the community	Force mains follow the contour of the land and are installed in shallow (below frost depth), narrow trenches that go in quickly with limited disruption to the community
	16	Typically installed with a trencher or directional borer	Large excavator and shoring required during excavation	Typically installed with a trencher or directional borer
	17	Avoids conflicts with existing utility services easily, at little or no cost	Often conflicts with existing utility services, requiring costly change orders and redesigns	Avoids conflicts with existing utility services easily, at little or no cost
	18	Uses low-cost air-release valves	Often uses high-cost air release valves	Uses high-cost air release valves
	19	Watertight collection system is largely immune to I/I	Non-watertight collection system is plagued by I/I, significantly increasing treatment costs	Watertight collection system is largely immune to I/I
	20	Does not require lift stations	Often requires multiple, large lift stations costing > $250,000 that require alarm response, back-up power; lift station R&R costs are expensive and can result in rate increases	Often requires large, intermediate lift stations costing > $250,000 that require immediate alarm response, back-up power; lift station R&R costs are expensive and can result in rate increases
	21	Inexpensive clean outs (at terminal ends of mainlines) replace expensive manholes	Requires manholes at intersections, changes in slope or direction, and at regular intervals along lines	Inexpensive clean-outs replace expensive manholes
	22	Does not require minimum velocities to avoid deposition of solids; no pigging required	Requires minimum velocities to avoid solids deposition; due to conveyance of the full waste stream, periodic cleaning and flushing of the lines is required	Requires minimum velocities to avoid solids deposition; due to conveyance of the full waste stream, periodic draining and flushing of the lines is required
Other Notes	23	Allows smaller, energy-efficient, low-cost treatment systems – such as media filters – because of lack of I/I and solids; solids digestion in on-lot tank significantly reduces solids management at treatment facility	Requires larger, energy-intensive, high-cost (capital and O&M) treatment facilities to handle I/I & solids; I/I can increase facility size by a factor of 10 or more	Requires larger, energy-intensive, costlier treatment facilities than effluent sewers due to solids; allows smaller treatment facilities than gravity sewer due to lower I/I
	24	Does not require influent bar screens, other traditional headworks, or full solids handling capacity	Requires influent screening, primary treatment, and full solids handling capacity	Requires influent screening, primary treatment, and full solids handling capacity
		[1] WERF Fact Sheet C3, "Performance & Cost of Decentralized Unit Processes: Effluent Sewer Systems," Water Environment Research Foundation, April 2010 [2] $2.50/mo/EDU pump R&R [illegible] "Orenco Effluent Sewer Systems: Operational Cost — On-lot Components," Orenco Systems, Inc., October 2009	[1] WERF Fact Sheet C1, "Performance & Cost of Decentralized Unit Processes: Gravity Sewer Systems," Water Environment Research Foundation, April 2010	[1] WERF Fact Sheet C2, "Performance & Cost of Decentralized Unit Processes: Pressure Sewer Systems," Water Environment Research Foundation, April 2010 [3] [illegible]

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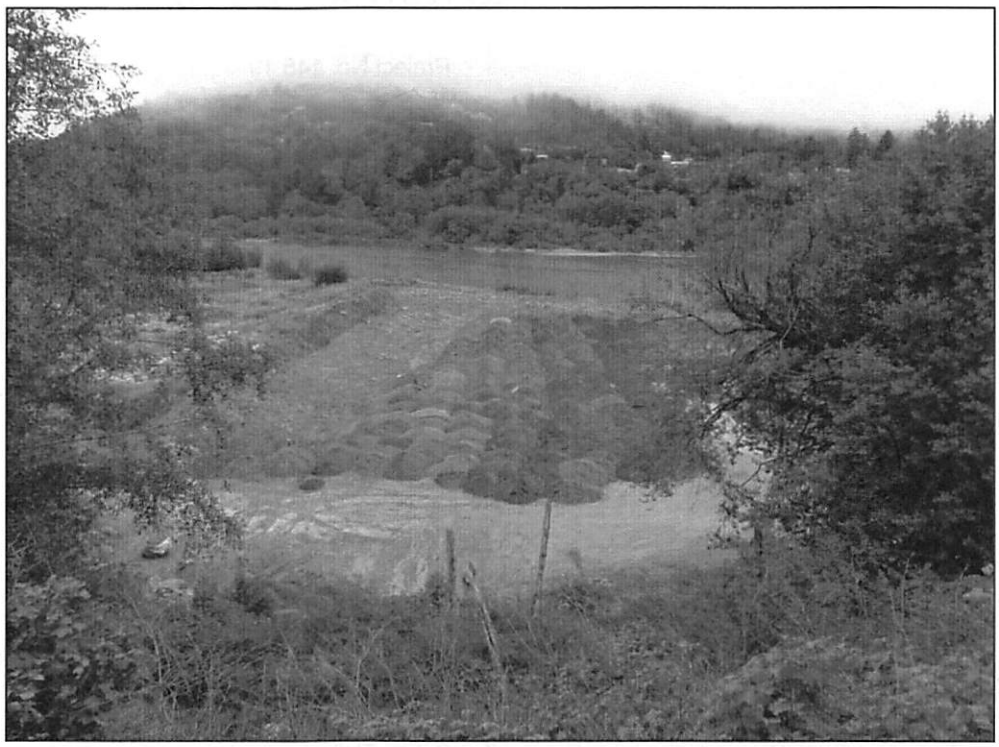
City of Brookings
Curry County, Oregon

NORTH BANK CHETCO RIVER ROAD WASTEWATER FEASIBILITY ANALYSIS

November 2010



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Project No. 145.19

City of Brookings
Curry County, Oregon

North Bank Chetco River Road Wastewater Feasibility Analysis

November 2010

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Expires: 12/31/11

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Introduction

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1

Introduction

1.1 Scope

This report provides a review of projected wastewater flow volumes, analyzes force main and gravity sewer routes and develops project costs for wastewater collection contemplated along the currently unserved area along both sides of North Bank Chetco River Road (NBCRR) which is north and east of Highway 101. This report addresses the feasibility and relative costs of sewage collection and transport alternatives as far north as the Tribble Development. The costs include initial project engineering and construction costs, annual operation and maintenance costs for pump stations, gravity lines and force mains as well as the total present worth costs of these alternatives. The improvement alternatives considered include those which are sized to provide capacity for only the near term future service area and for those which would provide flow through capacity for long-term development of locations further north along NBCRR. In the cases of alternatives sized to accommodate only the near term future sewer flows, a "penalty" consisting of the present worth cost of the additional force main which would be required in the future, in lieu of flow-through capacity, is added to the present worth cost of the short-term alternatives so that a decision may be made to select the most cost-effective alternative.

1.2 Purpose

The area of development within the Brookings urban growth boundary (UGB) on the east side of the City along North Bank Chetco River Road is not currently provided with a public sewage collection system. As development density increases and new development occurs, the adequacy and suitability of on-site septic systems decreases. It is also the case that over time, existing septic systems fail, and the need for a reliable community wide sewage collection system becomes apparent. It is the desire of the City of Brookings to determine the feasibility of providing public sewage collection services to this area to determine which alternatives may provide this service, and the costs of those alternatives. A key question to answer is whether it is more cost-effective to construct the near term future improvements with pass through capacity (including pumping capacity) adequate to carry the flow from the long- term development anticipated north of the Tribble Development, or if it would be more cost-effective for the flow from the long-term future to be conveyed to the Brookings sewer system via a separate force main which would be constructed at that future time.

1.3 Background

The proposed developments on the east or riverside of NBCRR and north of Highway 101 identified as the Tidewater Property and the Tribble Development are anticipated to create 209

wastewater equivalent dwelling units (EDUs). Currently, there are estimated to be 58 existing EDUs associated with the Riverside RV Resort and the Chetco River Resort, served by both communal and individual septic systems. In both of these two latter locations, further development is limited by the required drainage areas necessary to provide sewage treatment and disposal and, in both cases, additional development could be accommodated if a public sewer system was available.

On the west side of NBCRR and north of Highway 101, there are estimated to be 75 existing EDUs in the locations identified as the Lundeen Road Area and the Thompson Road Area.

This study primarily addresses the feasibility and alternatives for providing service for the areas on both sides of the NBCRR as identified above.

Flows from other areas must also be identified. Although they are not part of the scope of improvements proposed by this study, they have an impact on and limit the available carrying capacity of the existing sewer lines into which the proposed improvements would necessarily discharge wastewater flow. The discharge capacity restriction of primary concern is the City/Harbor Sanitary District (HSD) interceptor. This interceptor would also receive flow from the proposed improvements discussed in this report. Its capacity is 3,370 gpm. The agreement between the City and the HSD allocates 34% (1,146 gpm) to the City and 66% (2,224 gpm) to the HSD. The Harbor Sanitary District's main pump station currently has a maximum pump rate of 2,070 gpm representing 93.1 % of HSD's share.

The existing areas now discharging into the City/HSD interceptor include the Constitution Way Area, which currently has a 270 gpm pump station, as well as the Pacific Terrace Drive and Old County Road areas, currently served by existing gravity sewers, all of which ultimately drain into the City/Harbor Sanitary District (HSD) interceptor.

On the south side of Highway 101 and along the west bank of the Chetco River is the Bridge Street Area, estimated to have now or shortly require provision for 46 wastewater EDUs. As of this date, an additional 18-inch line is in the process of being designed and will run parallel with the existing City/HSD interceptor, providing relief and additional capacity. This line will be in service prior to improvements being constructed along NBCRR.

1.4 Location and Characteristics of Study Zones and Areas

A subset of the entire study area, Zone 1, includes the area of proposed sewer improvements generally defined as the unserved development along both sides of North Bank Chetco River Road (NBCRR), north of Highway 101, from the Tidewater Property to the Tribble Development. This zone includes the Tidewater Property, Riverside RV Resort, Chetco River Resort, Tribble Development, Thompson Road Area and Lundeen Road Area.

Another subset of the study area, Zone 2, includes those locations which contribute or will contribute flow to the City/HSD interceptor, including the Bridge Street Area, Constitution Way Area, Pacific Terrace Drive and Old Country Road. This zone is significant in that flows from it

impact the carrying capacity of the interceptor now and in the near term future, and potentially limit the amount of flow contribution allowable from Zone 1 improvements.

The last subset of the study area, Zone 3, includes those locations further north of the Tribble Development along NBCRR. Though not developed significantly now, the area may develop in the future. Flow from this zone would be pumped through a force main southward along NBCRR and could potentially be discharged into the system improvements investigated for Zone 1. Alternately, future flows from this area would be conveyed through a force main to a location near or south of the intersection of Highway 101 (Chetco Avenue) and Oak Street in order to be discharged into a gravity line with adequate capacity to handle this additional sewage contribution.. The service area locations comprising a portion of Zone 1 and Zone 3 are subdivided as Future Growth Areas 1 through 7.

Figure 1 shows the zone location boundaries and identification of the service areas referenced above.

Section

2

Existing Facilities

Section 2

Existing Facilities

2.1 Potential Discharge Locations to Existing System

The nearest available discharge locations for wastewater collected in the study area are a number of 8-inch lines in the area north of Chetco, east of Oak and west of NBCRR (or Old County Road as it transitions to on the west side of Azalea State Park). These lines all drain westward intersecting with the 15-inch line on Oak St. which then drains southward across Chetco, becoming an 18-inch line running to the plant. Other potential discharge locations are the existing Constitution Way Pump Station and the intersection of Oak Street and Chetco Avenue.

With regard to the carrying capacity of the 15-inch sewer main on Oak Street between Fir Street and Chetco Avenue, a review of Figure 6.1 West Side Interceptor and Extensions North from the *Wastewater Facilities Plan* of March 10, 2008 by HGE, Inc. indicates approximately 188 acres served by this main sewer line from the intersection of Oak Street and Chetco Avenue northward. Assuming for planning purposes a density of 4 EDUs per acre, a flow of 169,792 gpd may be estimated. This would produce a peak flow of 457 gpm not including I/I. A memo prepared October 12, 2009 by Dyer Partnership, indicated that I/I for this basin was estimated to be 134 gpm. This would result in a total existing flow of approximately 600 gpm. The carrying capacity, without surcharge, of a 15-inch gravity sewer at minimum slope is 1123 gpm. This would leave 523 gpm of capacity remaining for additional new flow.

Note that the maximum carrying capacity of 8-inch lines, without surcharge, under minimum slope conditions is 312 gpm. No flow monitoring has been conducted regarding the actual current flow rates in these sewer lines. For purposes of this study, estimates have been made. The specific available proposed discharge locations, relevant issues and their available capacities were investigated with the following results:

1. End of 8-inch sewer line at Fir Street/ Old County Road intersection – The new force main would follow NBCRR around the south side of Azalea State Park and then continue northward along Old County Road to intersection with this discharge point. Based on approximately 45 equivalent lots served by this 8-inch line (assuming each lot represents 1 EDU), the current maximum load would be estimated as 6,570 gpd with a peak rate of 27 gpm, not including inflow and infiltration (I/I). Assuming 20% I/I, the existing flow is estimated to be 32 gpm. This would allow 280 gpm capacity for additional flow. This discharge location would not require that private property be crossed to make the connection. However, the elevation of this location is approximately 200 feet. This will prove to be problematic for use of submersible pumps anticipated at the new pump station wet wells expected to have elevations of approximately 10 feet. The sum of the static head and the dynamic head loss (resulting from transport through the force mains)

will be greater than pumps of this type and flow range are able to overcome. This is not a viable discharge location due to the high head required to pump to it.

2. End of 8-inch sewer line at Pine Street/Myrtle Street intersection - The force main would follow NBCRR around the south side of Azalea State Park and then, at the transition to Old County Road, be routed west along a lot line to intersection with this discharge point. Based on approximately 24 equivalent lots served by this line (assuming each lot represents1 EDU), the current maximum load would be estimated as 3,500 gpd, with a peak rate of 15 gpm, not including I/I. Assuming 20% I/I, the existing flow is estimated to be 18 gpm. This would allow a 294 gpm capacity for additional flow. This route would require that easements be obtained to cross private property to make this connection. While a viable discharge location, the elevation of is 174 feet. This elevation produces head conditions near the approximate limit for submersible pumps of the flow range under consideration.

3. End of 8-inch sewer line located in easement between and parallel to Redwood Street and Chetco Avenue terminating at a southward extension of Myrtle Street - Based on approximately 18 equivalent lots served by this line (assuming each lot represents1 EDU), the current maximum load would be estimated as 2,628 gpd with a peak rate of 11 gpm, not including I/I. Assuming 20% I/I, the existing flow is estimated to be 13 gpm. However, this location currently receives the discharge from the CWLS (rated at 270 gpm) through a 4-inch force main. This is not a viable discharge location due to the small amount of remaining capacity.

4. End of 8-inch sewer line located on Lunden Road - The force main would leave NBCRR on the northeast side of Azalea State Park on Lunden Road to intersection with this discharge point. Based on approximately 24 equivalent lots served by this line (assuming each lot represents1 EDU), the current maximum load would be estimated as 7,300 gpd, with a peak rate of 30 gpm, not including I/I. Assuming 20% I/I, the existing flow is estimated to be 36 gpm. This would allow a 276 gpm capacity for additional flow. This route would require that easements be obtained to cross private property to make this connection. The elevation of this discharge location is 210 feet. This will prove to be problematic for use of submersible pumps anticipated at the new pump station wet wells expected to have elevations of approximately 10 feet. The sum of the static head and the dynamic head loss (resulting from transport through the force mains) will be greater than pumps of this type and flow range are able to overcome. This is not a viable discharge location due to the high head required to pump to it.

5. Constitution Way Pump Station – Discharge of flow from the new service area to the Constitution Way Pump Station is viable for flows of less than 229 gpm. This is based on the 270 gpm discharge capacity of the CWPS less its predicted long term local service area contribution of 41 gpm. In order to remain within this discharge limit, some alternatives require provision of pump station "cut-outs" to allow only a limited number of pump stations to discharge to CWPS at the same time. The elevation of this discharge location is 120 feet. This is a viable discharge location for those alternatives with low enough discharge flow.

6. Oak Street / Chetco Avenue Intersection - As noted previously, the City's capacity share of the existing City/Harbor Sanitary District (HSD) interceptor, which continues southward from Oak Street and Chetco Avenue to the treatment plant, is 1,146 gpm. Six hundred gpm is already or would be contributed from the existing service area from the north, leaving a capacity of only 546 gpm for new development along NBCRR. The new parallel interceptor would remove the HSD flow allocation in the amount of 2,224 gpm from the existing interceptor. The relieved interceptor, with a capacity of 3,370 gpm and with 600 gpm already allocated or utilized, will have a remaining capacity 2,770 gpm for the proposed immediate improvements, and for the long-term future improvements north of the Tribble Development along NBCRR. The elevation of this discharge location is 155 feet. Discharge to this location is most feasible for alternatives which route the force main south and parallel to Chetco via horizontal directional drilling.

2.2 Issue Regarding Waterlines

The location of other existing utilities, especially the location of waterlines, will impact the selection of proposed collection system elements, in particular the location of proposed force mains on NBCRR. The new wastewater force mains must be separated from water mains by a horizontal distance of at least 10 feet unless the new wastewater lines are laid at least 18 inches lower than the water main. In that case, a horizontal distance of at least 5 feet is required. The existing waterlines will complicate the installation of wastewater force mains and gravity sewer lines along NBCRR. A 14-inch waterline runs along the road from the water treatment plant to the proposed future new transmission booster pump station which will be just to the north of the Chetco River Resort. A 10-inch waterline continues south along NBCRR around the south side of Azalea Park and then continues north on Old County Road, with a 16-inch line also running along the road in the vicinity of the proposed booster station for a short distance before branching off to Lundeen Road to the west.

Design Data

Section

3

Section

3

Design Data

3.1 Capacity of Potential Receiving Locations

Shown below in Table 3.1.1, are the wastewater receiving capacities of potential discharge points in the existing sewer system for additional wastewater to be transported from various alternatives investigated. The available capacity reflects basic carrying capacity of the particular gravity sewer line or pump station as discussed in Section 2, less the current peak demand already being transported from or through this location. These capacities are presented to identify discharge receiving limitations which will be pertinent with regard to the development of viable alternatives subsequently in this report.

Table 3.1.1
Capacity Summary of Wastewater Receiving Locations

Location	Dia. Inches	Capacity GPM	Current GPM	Available GPM
Fir Street - Old County Rd to Oak	8	312	32	280
Pine Street - Myrtle Wood to Oak	8	312	18	294
Between Redwood and Chetco - Myrtle Wood to Oak	8	312	283	29
Lunden Road to Oak	8	312	36	276
Constitution Way Pump Station	WW*	270	41	229
Oak Street - Fir Street to Chetco Avenue	15	1,123	600	523
City/Harbor Sanitary District (HSD) interceptor Chetco to Plant - Existing	18	1,146 **	600	546
City/Harbor Sanitary District (HSD) interceptor Chetco to Plant – after HSD flow removed to new 18" line	18	3,370	600	2,770

* WW = Wet Well
** City's share of capacity

3.2 Gravity Sewer and Force Main Design Limitations

Shown below in Table 3.2.1, are the wastewater carrying capacities of various sizes of gravity sewer lines (without experiencing surcharging) based upon the minimum slopes (and drops per 1000 feet) for each pipe size required to achieve a proper scour velocity of at least 3 feet per second. These capacities and slopes are presented to aid with selection of sewer sizes required with regard to the development of viable alternatives subsequently in this report.

In like manner, Table 3.2.2 identifies the acceptable flow ranges for wastewater force mains such that velocities remain above the solids transport minimum of 3 feet per second and below the reasonable maximum of 7 feet per second. The maximum velocity limit is based upon a "rule of thumb" regarding development of excessive head loss for velocities greater than 7 feet per second. These capacities and slopes are presented to aid with selection of force main sizes required with regard to the development of viable alternatives subsequently in this report.

Table 3.2.1
Design Capacity of Gravity Sewers

Dia. Inches	Min. Slope	Drop/ 1000 ft. *	Max. GPM
8	0.0033	3.90	312
10	0.0025	3.10	492
12	0.0020	2.60	715
15	0.0015	2.10	1123
18	0.0011	1.70	1564
21	0.0009	1.50	2134
24	0.0008	1.40	2872

* To provide 3'/sec velocity

Table 3.2.2
Recommended Force Main Flow Ranges

Force Main Size	Min. Req'd GPM*	Max. Recom. GPM **
3"	67	155
4"	115	275
6"	265	620
8"	470	1100
10	735	1730
12	1060	2500
3.0 * for scour to 7.0** feet per second		

Section

4

Development of Alternatives

Section 4

Development of Alternatives

4.1 Alternative Descriptions

Alternatives 1.A and 1.B address short-term future improvements using only 2 new pump stations. The pump stations are arranged such that Pump Station # 2 pumps to Pump Station #1 and only Pump Station #1 transfers wastewater to the selected discharge location. For the short-term future improvements with 2 new pump stations and for discharge north of Chetco, only Constitution Way Pump Station was considered since this pump station has adequate receiving capacity and requires the least force main length for locations not precluded by elevation constraints. Alternative 1.B considers discharge to Oak and Chetco via a route

Alternatives 2.A and 2.B address short-term future improvements using 4 new pump stations. Discharge to the existing Constitution Way Pump Station was considered for Alternative 2 proposals, but ruled out after determining that the remaining capacity of the Constitution Way Pump Station would require that only 2 of the 4 new pump stations could discharge at the same time. While possible to arrange by telemetry, this would result in a poorly designed system which would be prone to overflow should all pump stations need to pump at the same time. Alternatives 3.A and 3.B address long-term future improvements using only 2 new pump stations. Note that alternative 3.A is determined to be infeasible due to receiving gravity sewer and/or Constitution Way Pump Station limitations, leaving only the option of discharge to Oak and Chetco. Alternatives 4.A and 4.B address long-term future improvements using 4 new pump stations. Note again that alternative 4.A is determined to be infeasible due to limitations of any of the 8" receiving gravity sewers and/or Constitution Way Pump Station, again leaving only Oak and Chetco as an alternative. The following charts discuss each alternative in greater detail. Detailed cost estimate are located in the appendix.

Alt. 1A – Short-term Future Improvements Only – 2 Pump Stations – Avoid FM on NBCRR as practical. Discharge to CW Pump Station	
Notes: This alternative provides for service to currently unserved area along both sides of North Bank Chetco River Road (NBCRR) as far north as the Tribble Development only. These improvements would not be sized to serve the long-term future development north of Tribble. This alternative would include only 2 pump stations; the force mains from these stations would run in the same trenches as proposed gravity lines to the extent possible to avoid impacting NBCRR as much as possible. Force mains would be installed by horizontal directional drilling (HDD), except where able to lay with gravity sewer lines. Flow from the new service area would be discharged into the Constitution Way Pump Station via Pump Station 2. See Figure 2.	
(1) Collection/transportation method	Combination of gravity sewers and force with 2 new pump stations and utilizing 1 existing pump station.
(2) Collection/transportation sizing	**Peak flow Recv'd**: PS 2 (Tribble) 40 gpm, PS 1 (Tidewater) 210 gpm; CW Pump Station 245 gpm. **Discharge**: PS 1 w/ 4" FM @ 210 gpm, PS 2 w/ 3" FM @ 70 gpm. CW Pump Station 270 gpm. Receiving sewer capacity downstream: OK
(3) System advantages, disadvantages, and reliability.	This alternative would minimize traffic disruption and pavement damage to NBCRR. It would be sized to handle only the immediate development between Tribble and Tidewater properties. Having 3 pump stations for transport (including the Constitution Way Pump Station) provides a more reliable system than alternatives with a greater number of pump stations and a less reliable system than alternatives with fewer pump stations. The pump stations require standby generators to achieve reliability satisfactory to regulatory authority.
(4) Special problems associated with alternative.	Further development north of Tribble would not be able to discharge into this proposed system and would in the future, require a force main along NBCRR running all the way to Oak St. and Chetco. Design will require that pump stations and manhole elevations be designed with flood plain elevation of the Chetco River in mind.

Alt. 1A – Short-term Future Improvements Only – 2 Pump Stations – Avoid FM on NBCRR as practical. Discharge to CW Pump Station – (Cont.)	
(5) Operation requirements.	
(a) Training required.	Instruction by vendor regarding O&M for new pump station components during start-up.
(b) Duties and man-hours required.	For 70 and 210 gpm PS - 52 hrs per year and 6 hrs per year training each.
(c) Emergency or malfunction impacts to users.	Overflow of wastewater into the Chetco River is possible. The risk is minimized through provision of standby-power and alarm systems providing notification of high-wet well levels and equipment malfunction
(6) Maintenance requirements.	
(a) Routine maintenance.	Lubricate and clean
(b) Man-hours required.	For 70 gpm PS - 72 hours per year For 210 gpm PS – 90 hours per year
(7) Testing and monitoring.	
(a) Facilities, tests, and equipment required and available.	All test equipment currently available to City. Includes ohm, volt, amp meters.
(b) Skills required.	Mechanical, electrical – operator level.
(c) Man-hours required.	See operation man-hours above
(d) Reports and forms required.	Same as existing pump stations for two additional pump stations.
Total Project Cost	$3,863,000

Alt. 1.B – Short-term Future Improvements Only – 2 Pump Stations – Avoid FM on NBCRR as practical. Discharge to Oak and Chetco via FM south Along Chetco	
Notes: This alternative provides for service to currently unserved areas along both sides of North Bank Chetco River Road (NBCRR) as far north as the Tribble Development only. These improvements would not be sized to serve the long-term future development north of Tribble. This alternative would include only 2 pump stations and the force mains from these stations would run in the same trenches as proposed gravity lines to the extent possible to avoid impacting NBCRR as much as possible. Flow from the new service area would be discharged into 20-inch interceptor at Oak and Chetco via a force main running parallel and south of Chetco from the south side of the Tidewater property and under the Highway 101 bridge. Force mains would be installed by horizontal directional drilling (HDD) except where able to lay with gravity sewer lines See Figure 2.	
(1) Collection/transportation method.	Combination of gravity sewers and force main with 2 new pump stations.
(2) Collection/transportation sizing	**Peak flow Recv'd** : PS 2 (Tribble) 40 gpm, PS 1 (Tidewater) 210 gpm **Discharge**: PS 1 w/ 4" FM @ 210 gpm, PS 2 w/ 3" FM @ 70 gpm. Receiving sewer capacity downstream: OK
(3) System advantages, disadvantages, and reliability.	This alternative would minimize traffic disruption and pavement damage to NBCRR. It would be sized to handle only the immediate development between Tribble and Tidewater properties. Having only 2 pump stations provides a more reliable system than alternatives with a greater number of pump stations. The pump stations require standby generators to achieve reliability satisfactory to regulatory authority.
(4) Special problems associated with alternative.	Further development north of Tribble would not be able to discharge into this proposed system and would, in the future, require a force main along NBCRR running all the way to Oak and Chetco. Design will require that pump stations and manhole elevations be designed with flood plain elevation of the Chetco River in mind.

Alt. 1.B – Short-term Future Improvements Only – 2 Pump Stations – Avoid FM on NBCRR as practical. Discharge to Oak and Chetco via FM south Along Chetco – (Cont.)	
(5) Operation requirements.	
(a) Training required.	Instruction by vendor regarding O&M for new pump station components during start-up.
(b) Duties and man-hours required.	For 70 and 210 gpm PS - 52 hrs per year and 6 hrs per year training each.
(c) Emergency or malfunction impacts to users.	Overflow of wastewater into the Chetco River is possible. The risk is minimized through provision of standby power and alarm systems providing notification of high wet well levels and equipment malfunction.
(6) Maintenance requirements.	
(a) Routine maintenance.	Lubricate and clean
(b) Man-hours required.	For 70 gpm PS - 72 hours per year For 210 gpm PS – 90 hours per year
(7) Testing and monitoring.	
(a) Facilities, tests, and equipment required and available.	All test equipment currently available to City. Includes ohm, volt, amp. meters.
(b) Skills required.	Mechanical, electrical – operator level.
(c) Man-hours required.	See operation man-hours above
(d) Reports and forms required.	Same as existing pump stations for two additional pump stations.
Total Project Cost	$4,018,000

Alt. 2A – Short-term Future Improvements Only – 4 New Pump Stations – FM along NBCRR to PS 1, gravity sewer route, south under 101 Bridge. Discharge to Oak & Chetco Gravity Line	
Notes: This alternative provides for service to currently unserved area along both sides of North Bank Chetco River Road (NBCRR) as far north as the Tribble Development only. These improvements would not be sized to serve the long-term future development north of Tribble. This alternative would include 4 pump stations, and the force mains from these stations would discharge into a single 4-inch and 6–inch FM along NBCRR. Flow from the new service area would be discharged into the Constitution Way Pump Station. See Figure 3.	
(1) Collection/transportation method.	Combination of gravity sewers and force main with 4 new pump stations and utilizing 1 existing pump station.
(2) Collection/transportation sizing	**Peak flow Recv'd:** PS 1 (Tidewater) 91 gpm; PS 2 (Riverside RV) 12 gpm; PS 3 (Chetco River Resort) 26 gpm; PS 4 (Tribble) 46 gpm; CW Pump Sta. (35 + 115 + 67 gpm) 217 gpm. **Discharge**: PS 1 w/ 4" FM @ 120 gpm. PS 2 thru 4 w/3" FM @ 70 gpm each. Pump stations pump to Oak and Chetco via a single 4-inch and 6-inch force main at a maximum flow rate of 330 gpm. Receiving sewer capacity downstream: OK
(3) System advantages, disadvantages, and reliability.	This alternative would simplify system development and allow pump stations to be staged as required. Disruption and pavement damage to NBCRR would be a disadvantage. This alternative would be sized to handle only the development between Tribble and Tidewater properties. Five pump stations for transport (including the Constitution Way Pump Station) provides a less reliable system than alternatives with fewer pump stations. The pump stations require standby generators to achieve reliability satisfactory to regulatory authority.

Alt. 2A – Short-term Future Improvements Only – 4 New Pump Stations – FM along NBCRR to PS 1, gravity sewer route, south under 101 Bridge. Discharge to Oak & Chetco Gravity Line – (Cont.)	
(4) Special problems associated with alternative.	Further development north of Tribble would not be able to discharge into this proposed system and would, in the future, require a separate force main along NBCRR running all the way to Oak St. and Chetco Ave. Design will require that pump stations and manhole elevations be designed with flood plain elevation of the Chetco River in mind.
(5) Operation requirements.	
(a) Training required.	Instruction by vendor regarding O&M for new pump station components during start-up.
(b) Duties and man-hours required.	For 70 and 210 gpm PS's - 52 hrs per year and 6 hrs per year training each.
(c) Emergency or malfunction impacts to users.	Overflow of wastewater into the Chetco River is possible. The risk is minimized through provision of standby power and alarm systems providing notification of high wet well levels and equipment malfunction.
(6) Maintenance requirements.	
(a) Routine maintenance.	Lubricate and clean
(b) Man-hours required.	For 70 gpm PS - 72 hours/year each of 3 Pump Stations. For 210 gpm PS – 90 hours per year
(7) Testing and monitoring.	
(a) Facilities, tests, and equipment required and available.	All test equipment currently available to City. Includes ohm, volt, amp meters.
(b) Skills required.	Mechanical, electrical – operator level.
(c) Man-hours required.	See operation man-hours above.
(d) Reports and forms required.	Same as existing pump stations for four additional pump stations.
Total Project Cost	$4,860,000

Alt. 2B – Short-term Future Improvements Only – 4 New Pump Stations – FM on NBCRR. Discharge to 8-inch sewer at Pine & Myrtle	
Notes: This alternative provides for service to currently unserved area along both sides of North Bank Chetco River Road (NBCRR) as far north as the Tribble Development only. These improvements would not be sized to serve the long-term future development north of Tribble. This alternative would include 5 pump stations and the common 4" force main from these stations would generally run along NBCRR. Flow from the new service area would be discharged into end of an 8" sewer at the intersection of Fir and Old County Rd. See Figure 3.	
(1) Collection/transportation method.	Combination of gravity sewers and force with 4 new pump stations.
(2) Collection/transportation sizing	**Peak flow Recv'd** : PS 1 (Tidewater) 91 gpm; PS 2 (Riverside RV) 12 gpm; PS 3 (Chetco River Resort) 26 gpm; PS 4 (Tribble) 46 gpm. **Discharge**: Must provide controls for interruption so that only 3 of 4 upstream pump stations can pump to 8" sewer line via a common 6" FM at the same time. PS 1 w/ 4" FM @ 120 gpm. PS 2 thru 4 w/3" FM @ 70 gpm each. Max. of 3 stations at same time would result in 260 gpm. Receiving sewer capacity downstream: OK
(3) System advantages, disadvantages, and reliability.	This alternative would simplify system development and allow pump stations to be staged as required. Disruption and pavement damage to NBCRR would be a disadvantage. This alternative would be sized to handle only the immediate development between Tribble and Tidewater properties. Having 4 pump stations for transport provides a less reliable system than alternatives with fewer pump stations. The pump stations require standby generators to achieve reliability satisfactory to regulatory authority.

Alt. 2B – Short-term Future Improvements Only – 4 New Pump Stations – FM on NBCRR. Discharge to 8-inch sewer at Pine & Myrtle – (Cont.)	
(4) Special problems associated with alternative.	Interruption of pumping via SCADA control would decrease reliability and would increase the change of overflows. Further development north of Tribble would not be able to discharge into this proposed system and would in the future, require a separate force main along NBCRR running all the way to Oak and Chetco. Design will require that pump stations and manhole elevations be designed with flood plain elevation of the Chetco River in mind.
(5) Operation requirements.	
(a) Training required.	Instruction by vendor regarding O&M for new pump station components during start-up.
(b) Duties and man-hours required.	For 70 and 120 gpm PS - 52 hrs per year and 6 hrs per year training each.
(c) Emergency or malfunction impacts to users.	Overflow of wastewater into the Chetco River is possible. The risk is minimized through provision of standby power and alarm systems providing notification of high wet well levels and equipment malfunction
(6) Maintenance requirements.	
(a) Routine maintenance.	Lubricate and clean
(b) Man-hours required.	For 70 gpm and 120 gpm PS - 72 hours/year each of 4 Pump Stations.
(7) Testing and monitoring.	
(a) Facilities, tests, and equipment required and available.	All test equipment currently available to City. Includes ohm, volt, amp meters.
(b) Skills required.	Mechanical, electrical – operator level.
(c) Man-hours required.	See operation man-hours above
(d) Reports and forms required.	Same as existing pump stations for four additional pump stations.
Total Project Cost	$5,020,000

Alt. 3A – Long-term Future Improvements – 2 Pump Stations – Avoid FM on NBCRR as practical. Discharge to CW Pump Station or Discharge to Fir and Old County Rd.
Notes: Not feasible due to limitation of CW Pump Station Capacity and 8" sewer capacity from Fir and Old County Rd.

Alt. 3.B – Long-term Future Improvements – 2 Pump Stations – Avoid FM on NBCRR as practical. Discharge to Oak and Chetco via FM south along Chetco	
Notes: This alternative provides for service to currently unserved areas along both sides of North Bank Chetco River Road (NBCRR) and long-term development areas farther north. These improvements would be sized to serve the long-term future development north of Tribble. This alternative would include only 2 pump stations, and the force mains from these stations would run in the same trenches as proposed gravity lines to the extent possible to avoid impacting NBCRR as much as possible. Flow from the new service area would be discharged into the 20" interceptor at Oak St. and Chetco Ave. via a force main running parallel to and south of Chetco Ave. from the south side of the Tidewater property and under the Highway 101 bridge. Force mains would be installed by horizontal directional drilling (HDD) except where able to lay with gravity sewer lines See Figure 4.	
(1) Collection/transportation method.	Combination of gravity sewers and force main with 2 new pump stations.
(2) Collection/transportation sizing	**Peak flow Recv'd:** PS 1 (Tidewater) 775 gpm; PS 2 (Tribble) 593 gpm. **Discharge**: PS 1 w/ 8" FM @ 775 gpm. PS 2 w/ 6" FM @ 600 gpm. Receiving sewer capacity downstream: OK
(3) System advantages, disadvantages, and reliability.	This alternative would minimize traffic disruption and pavement damage to NBCRR. It would be sized to handle only the immediate development between Tribble and Tidewater properties and future development along NBCRR to the north. Having only 2 pump stations provides a more reliable system than alternatives with a greater number of pump stations. The pump stations require standby generators to achieve reliability satisfactory to regulatory authority.
(4) Special problems associated with alternative.	Pump stations would require that wet wells and pump spaces and piping be sized to accommodate future development north of Tribble. Initially pumps would be sized for short-term future development but would need to be upsized in the future for additional development. Design will require that pump stations and manhole elevations be designed with flood plain elevation of the Chetco River in mind.

Alt. 3.B – Long-term Future Improvements – 2 Pump Stations – Avoid FM on NBCRR as practical. Discharge to Oak and Chetco via FM south along Chetco – (Cont.)	
(5) Operation requirements.	
(a) Training required.	Instruction by vendor regarding O&M for new pump station components during start-up.
(b) Duties and man-hours required.	For 600 and 775 gpm PS - 52 hrs per year and 8 hrs per year training each.
(c) Emergency or malfunction impacts to users.	Overflow of wastewater into the Chetco River is possible. The risk is minimized through provision of standby-power and alarm systems providing notification of high-wet well levels and equipment malfunction
(6) Maintenance requirements.	
(a) Routine maintenance.	Lubricate and clean
(b) Man-hours required.	For 600 gpm and 775 PS - 110 hours/year each.
(7) Testing and monitoring.	
(a) Facilities, tests, and equipment required and available.	All test equipment currently available to City. Includes ohm, volt, amp meters.
(b) Skills required.	Mechanical, electrical – operator level.
(c) Man-hours required.	See operation man-hours above
(d) Reports and forms required.	Same as existing pump stations for two additional pump stations.
Total Project Cost	$4,475,000

Alt. 4A – Long-term Future Improvements – 4 New Pump Stations – FM on NBCRR. Discharge to CW Pump Station or Discharge to Fir and Old County Rd.
Notes: Neither discharge location feasible due to limitation of CW Pump Station capacity and 8" sewer capacity from Fir and Old County Rd.

Alt. 4B – Long-term Future Improvements – 4 New Pump Stations – FM on NBCRR. Discharge to Oak and Chetco via FM south along Chetco	
Notes: This alternative provides for service to currently unserved area along both sides of North Bank Chetco River Road (NBCRR) as far north as the Tribble Development with provision to serve the long-term future development north of Tribble. This alternative would include 4 pump stations and the force mains from these stations would generally run along NBCRR. The force main would leave NBCRR and be routed along the Tidewater Property, then south under the 101 bridge, and then west along the south side of Chetco Ave. to be discharged into the interceptor at Oak St. and Chetco Ave. See Figure 5.	
(1) Collection/transportation method.	Combination of gravity sewers and force with 4 new pump stations.
(2) Collection/transportation sizing	**Peak flow Recv'd** : PS 1 (Tidewater) 91 gpm; PS 2 (Riverside RV) 21 gpm; PS 3 (Chetco River Resort) 43 gpm; PS 4 (Tribble) 590 gpm. **Discharge**: PS 1 w/ 4" FM @ 120 gpm. PS 2 & 3 w/3" FM @ 70 gpm each. PS 4 w/ 6" FM @ 600 gpm. Common 8" FM @ 860 gpm. Receiving sewer capacity downstream: OK
(2) System advantages, disadvantages, and reliability.	This alternative would simplify system development and allow pump stations to be staged as required. Traffic disruption and pavement damage to NBCRR would be a disadvantage. This alternative would be sized to handle the immediate development between Tribble and Tidewater properties with capacity for long-term development further north. Having 4 pump stations for transport provides a less reliable system than alternatives with fewer pump stations. The pump stations require standby generators to achieve reliability satisfactory to regulatory authority.
(3) Special problems associated with alternative.	Pump stations would require that wet wells, pump spaces and piping be sized to accommodate future development north of Tribble. Initially pumps would be sized for short-term future development but would need to be upsized in the future for the additional further development. Design will require that pump stations and manhole elevations be designed with flood plain elevation of the Chetco River in mind.

Alt. 4B – Long-term Future Improvements – 4 New Pump Stations – FM on NBCRR. Discharge to Oak and Chetco via FM south along Chetco – (Cont.)	
(4) Operation requirements.	
(a) Training required.	Instruction by vendor regarding O&M for new pump station components during start-up.
(b) Duties and man-hours required.	For 70 and 120 gpm PS's - 52 hrs per year and 6 hrs per year training each. For 600 gpm PS – 52 hrs per year and 8 hrs per year training.
(c) Emergency or malfunction impacts to users.	Overflow of wastewater into the Chetco River is possible. The risk is minimized through provision of standby power and alarm systems providing notification of high wet well levels and equipment malfunction.
(5) Maintenance requirements.	
(a) Routine maintenance.	Lubricate and clean
(b) Man-hours required.	For 70 and 120 gpm PS – 72 hours/year each. For 600 gpm PS - 110 hours/year.
(6) Testing and monitoring.	
(a) Facilities, tests, and equipment required and available.	All test equipment currently available to City. Includes ohm, volt, amp meters.
(b) Skills required.	Mechanical, electrical – operator level
(c) Man-hours required.	See operation man-hours above.
(d) Reports and forms required.	Same as existing pump stations for five additional pump stations.
Total Project Cost	$5,539,000

4.2 Comparison of Alternatives

Included below in Tables 4.2.1 through 4.2.10, is information used to develop and differentiate the alternatives listed in section 4.1, preceding. EDU density information was provided by the City of Brookings. Flow values were derived from this data.

Table 4.2.1
Near Term Alternative Wastewater – 2 Pump Station Option

Location	EDU	GPD	Peak GPM	PS 2 GPM	PS1 GPM
Tidewater Property	150	21900	91	0	91
Bridge Street Area	46	6716	28	0	0
Chetco River Resort	36	5256	22	0	22
Constitution Way Area	58	8468	35	0	0
Lundeen Road Area (1/4 to PS1)	52	7592	32	0	8
Old County Road	60	8760	37	0	0
Pacific Terrace Drive	22	3212	13	0	0
Riverside RV Resort	19	2774	12	0	12
Thompson Road Area: 1/4 to PS2, 3/4 to PS1	23	3358	14	4	10
Tribble Development	59	8614	36	36	0
PS 2 to PS 1					67
Totals	525	76650	319	40	210

Table 4.2.2
Near Term Alternative Wastewater – 4 Pump Station Option

Location	EDU	GPD	Peak GPM	PS 1 GPM	PS 2 GPM	PS 3 GPM	PS 4 GPM
Tidewater Property	150	21900	91	91	0	0	0
Bridge Street Area	46	6716	28	0	0	0	0
Chetco River Resort	36	5256	22	0	0	22	0
Constitution Way Area	58	8468	35	0	0	0	0
Lundeen Rd Area: 1/4 to PS2, 3/4 to 15" S	52	7592	32	0	8	0	0
Old County Road	60	8760	37	0	0	0	0
Pacific Terrace Drive	22	3212	13	0	0	0	0
Riverside RV Resort	19	2774	12	0	12	0	0
Thompson Road Area: 1/4 to PS4, 3/4 to PS3	23	3358	14	0	0	10	4
Tribble Development	59	8614	36	0	0	0	36
Sub total	525	76650	319	91	20	32	40
PS1 to FM				115	0	0	0
PS2 to FM				0	67	0	0
PS3 to FM				0	0	67	0
PS4 to FM				0	0	0	67

Table 4.2.3
Long-Term Alternative Wastewater – 2 Pump Station Option

Location	EDU	GPD	Peak GPM	PS 2 GPM	PS1 GPM
Tidewater Property	150	21900	91	0	91
Bridge Street Area	46	6716	28	0	0
Chetco River Resort	56	8176	34	0	34
Constitution Way Area	68	9928	41	0	0
Lundeen Road Area	62	9052	38	0	9
Old County Road	75	10950	46	0	0
Pacific Terrace Drive	32	4672	19	0	0
Riverside RV Resort	34	4964	21	0	21
Thompson Road Area	43	6278	26	6	20
Tribble Development	59	8614	36	36	0
Map 1	102	14892	62	62	0
Map 2	116	16936	71	71	0
Map 3	150	21900	91	91	0
Map 4	122	17812	74	74	0
Map 5	168	24528	102	102	0
Map 6	164	23944	100	100	0
Map 7	84	12264	51	51	0
PS 2 to PS 1					600
Totals	1531	223526	931	593	775

Table 4.2.4
Long-Term Alternative Wastewater – 4 Pump Station Option

Location	EDU	GPD	Peak GPM	PS 1 GPM	PS 2 GPM	PS 3 GPM	PS 4 GPM
Tidewater Property	150	21900	91	91	0	0	0
Bridge Street Area	46	6716	28	0	0	0	0
Chetco River Resort	56	8176	34	0	0	34	0
Constitution Way Area	68	9928	41	0	0	0	0
Lundeen Road Area	62	9052	38	0	0	0	0
Old County Road	75	10950	46	0	0	0	0
Pacific Terrace Drive	32	4672	19	0	0	0	0
Riverside RV Resort	34	4964	21	0	21	0	
Thompson Road Area	43	6278	26	0	0	9	3
Tribble Development	59	8614	36	0	0	0	36
Map 1	102	14892	62	0	0	0	62
Map 2	116	16936	71	0	0	0	71
Map 3	150	21900	91	0	0	0	91
Map 4	122	17812	74	0	0	0	74
Map 5	168	24528	102	0	0	0	102
Map 6	164	23944	100	0	0	0	100
Map 7	84	12264	51	0	0	0	51
Subtotal	1531	223526	931	91	21	43	590
PS 1 to 8" FM via 4"				115			
PS 2 to 8" FM via 3"					67		
PS 3 to 8" FM via 3"						67	
PS 4 to 8" FM via 6"							590

Table 4.2.5
Summary of Pump Station Costs

70 GPM PUMP STATIONS 10 HP	
Initial Capital Cost	$ 345,255
O&M Annual Cost	$ 5,941
Present Worth	$ 429,698
120 GPM PUMP STATIONS 40 HP	
Initial Capital Cost	$ 422,425
O&M Annual Cost	$ 8,795
Present Worth	$ 547,427
120 GPM PUMP STATIONS 50 HP	
Initial Capital Cost	$ 434,225
O&M Annual Cost	$ 9,613
Present Worth	$ 570,846
120 GPM PUMP STATIONS 60 HP	
Initial Capital Cost	$ 442,925
O&M Annual Cost	$ 10,330
Present Worth	$ 589,739
210 GPM PUMP STATIONS 40 HP	
Initial Capital Cost	$ 437,025
O&M Annual Cost	$ 9,950
Present Worth	$ 578,438
210 GPM PUMP STATIONS 60 HP	
Initial Capital Cost	$ 442,925
O&M Annual Cost	$ 10,330
Present Worth	$ 589,739
600 GPM PUMP STATIONS 15 HP	
Initial Capital Cost	$ 476,800
O&M Annual Cost	$ 10,637
Present Worth	$ 627,976
600 GPM PUMP STATIONS 60 HP	
Initial Capital Cost	$ 542,600
O&M Annual Cost	$ 13,476
Present Worth	$ 734,130
775 GPM PUMP STATIONS 60 HP	
Initial Capital Cost	$ 528,227
O&M Annual Cost	$ 13,539
Present Worth	$ 720,648

Table 4.2.6
Summary of Line Costs

8" Gravity Sewer in Roadway	$188
8" Gravity Sewer Not in Roadway	$114
12" Gravity Sewer in Roadway	$211
12" Gravity Sewer Not in Roadway	$137
3" Force Main in Roadway	$109
3" Force Main Common w/ Gravity Sewer	$63
3" Force Main Not in Roadway	$51
4" Force Main in Roadway	$118
4" Force Main Common w/ Gravity Sewer	$72
4" Force Main Not in Roadway	$60
6" Force Main in Roadway	$127
6" Force Main Common w/ Gravity Sewer	$81
6" Force Main Not in Roadway	$69
8" Force Main in Roadway	$136
8" Force Main Common w/ Gravity Sewer	$90
8" Force Main Not in Roadway	$77
10" Force Main Increase in Roadway	$156
10" Force Main Common w/ Gravity Sewer	$103
10" Force Main Not in Roadway	$89
HDD 8" Cost per Foot (100%)	$138
HDD 6" Cost per Foot (95%)	$131
HDD 4" Cost per Foot (90%)	$124
HDD 3" Cost per Foot (85%)	$117

Table 4.2.7
Summary of Pump Station Costs for Each Alternative

ALT.	70 GPM 10 HP	120 GPM 40 HP	120 GPM 50 HP	120 GPM 60 HP	210 GPM 40 HP	210 GPM 60 HP	600 GPM 15 HP	600 GPM 60 HP	775 GPM 60 HP	INITIAL COST	O&M ANNUAL	TOTAL PW
1 A	1	0	0	0	1	0	0	0	0	$ 782,280	$ 15,891	$ 1,008,136
1 B	1	0	0	0	0	1	0	0	0	$ 788,180	$ 16,271	$ 1,019,437
2 A	0	0	3	1	0	0	0	0	0	$ 1,745,600	$ 39,168	$ 2,302,278
2 B	0	1	2	1	0	0	0	0	0	$ 1,733,800	$ 38,351	$ 2,278,859
3 A	NA											
3 B	0	0	0	0	0	0	1	0	1	$ 1,005,027	$ 24,176	$ 1,348,624
4 A	NA											
4 B	0	3	0	0	0	0	0	1	0	$ 1,809,875	$ 39,862	$ 2,376,411

Table 4.2.8
Summary of Force Main /Gravity Sew. Line Costs for Each Alternative

ALTERN.		INIT. COST	O&M ANNUAL	TOTAL PW
1	A	$3,095,694	$2,939	$3,137,468
1	B	$3,298,913	$3,154	$3,343,739
2	A	$3,457,215	$3,170	$3,502,268
2	B	$3,576,139	$3,263	$3,622,518
3	A	N/A	NA	
3	B	$3,442,262	$3,154	$3,487,088
4	A	N/A	NA	
4	B	$3,809,196	$3,263	$3,855,575

Table 4.2.9
Calculation of Present Worth Future Force Main
To be Added to Short-term Alternatives*

Additional Force Main Length - feet	7436
Diameter – inches	8
Road Bore length - feet	90
HDD Length - feet	3000
Total Surface Installation - feet	4346
Asphalt Surface C&R - feet	3500
Flow Rate – GPM**	550 to 750
Construction Cost	$772,433
O&M Annual Cost	$1,041
Present Worth of Future Int. Cost	**$461,052**
Present Worth of Future O&M Costs	**$8,830**
Total PW	**$469,882**

* Based on installation of a force main to Oak Street and Chetco Avenue generally via NBCRR 15 years in the future to carry long-term development area future wastewater. Add present worth costs to short-term alternatives.

** Flow rate depends on future pump station configuration in long-term development areas.

Table 4.2.10
Summary of Total Alternative Costs

ALTERN.		INIT. COST	O&M ANNUAL	O&M Present Worth	Additional PW for Alt. 1.A thru 2.B	TOTAL PW
1	A	$3,862,902	$18,831	$267,629	$ 469,882	$4,600,413
1	B	$4,018,300	$19,425	$276,083	$ 469,882	$4,764,265
2	A	$4,859,512	$42,077	$598,013	$ 469,882	$5,927,407
2	B	$5,019,983	$41,404	$588,450	$ 469,882	$6,078,315
3	A	Not viable	NA	NA	NA	NA
3	B	$4,475,452	$27,330	$388,423	NA	$4,863,875
4	A	Not viable	NA	NA	NA	NA
4	B	$5,539,020	$42,915	$609,928	NA	$6,148,948

Section

5

Recommended Alternative

Section

5

Recommended Alternative

5.1 Short-term Future Improvement

The alternative recommended for Brookings is **1.A "Short-term Future Improvements – 2 Pump Stations"**. This alternative will provide two pump stations. Pump Station 2 would be located at the Tribble Property and would be sized to handle a peak flow of 40 GPM and pump at 70 GPM. Pump Station 1 would be located between the Tidewater Property and Riverside RV Park and would be sized to handle and pump 210 GPM (including the discharge from PS 2). Pump Station 1 would discharge to the Constitution Way (CW) Pump Station. Total peak flow received at the CW pump station would be 245 GPM including the flow from PS 1 and the CW service area. CW pump station has a capacity of 270 GPM. The receiving sewer capacity downstream is adequate for this flow rate.

The initial capital project cost of this recommended alternative is approximately $3,863,000. This alternative's present worth cost includes the "penalty" of the future installation and O&M of a separate force main from the north end of the Tribble Property running along North Bank Chetco River Road (NBCRR) to Oak and Chetco estimated to be installed 15 years in the future. This additional future force main is estimated to cost $772,433 in current dollars and to have an annual O&M cost of $1,041. The present worth cost of this additional force main, including both capital and O&M costs, is $469,900. The present worth cost of Alternative 1.A is approximately $4,600,000. This figure includes estimated O&M for pump stations, force mains and gravity lines as well as the present worth cost of the future additional force main.

5.2 Long-term Future Improvement

The most cost-effective long-term future alternative is 3.B **"Long-term Future Improvements – 2 Pump Stations".** It is designed to handle flow received from the long- term future development area north of the short-term future service area at the north end of the Tribble Property and convey this flow through the improvements proposed for immediate construction. Pump Station 2 would be located at the Tribble Property and be sized to handle a peak flow of 593 GPM and pump at 600 GPM. Pump Station 1 would be located between the Tidewater Property and Riverside RV Park, and would be sized to handle and pump 775 GPM (including the discharge from PS 2). Pump Station 1 would discharge to an interceptor near Oak Street and Chetco Avenue. The receiving sewer capacity downstream will be adequate for this flow rate after construction of a new 18-inch or larger interceptor from this location to the wastewater treatment plant.

This long-term alternative has a capital project cost of approximately $4,475,000. The present worth cost of this alternative is approximately $4,864,000, including estimated O&M for pump stations, force mains and gravity lines. This alternative does not include the "penalty" of the future installation and O&M of a separate force main along North Bank Chetco River Road (NBCRR).

5.3 Recommended Improvement

Long-term future Alternative 3.B has a present worth cost $264,000 greater than short-term future Alternative 1.A The analysis indicates that even though the installation of the future force main on NBCRR will be disruptive of traffic and may be difficult to construct, the present worth cost of this expense does not warrant construction of immediate improvements sized to accommodate the long-term service area. This is based on the assumptions made regarding routing, costs, interest of 3.5%, and on the assumption that the future service area force main will not be required for 15 more years. The present worth cost advantage would still favor Alternative 1.A over 3.B until such time as the future force main requirement north of Tribble Development was less than 3 years in future.

We therefore conclude that Alternative 1.A is the most cost effective, recommended alternative. The discharge head conditions for this alternative provide for reasonably efficient pump selection

5.4 Allocation of Costs

For alternative 1.A, the capital costs of the recommended project are allocated to the various service areas based upon their estimated flow contributions as shown in Table 5.4.1 below.

Table 5.4.1
Cost Allocation of Recommended Project

LOCATION	EDU	% of Use	Cost Allocation
Tidewater Property	150	50.0	$1,931,451
Chetco River Resort	36	12.0	$463,548
Lunden Road Area	13	4.3	$167,392
Riverside RV Resort	19	6.3	$244,650
Thompson Road Area	23	7.7	$296,156
Tribble Development	59	19.7	$759,704
Subtotal	300	100.0	$3,862,902
Cost per EDU			$12,876

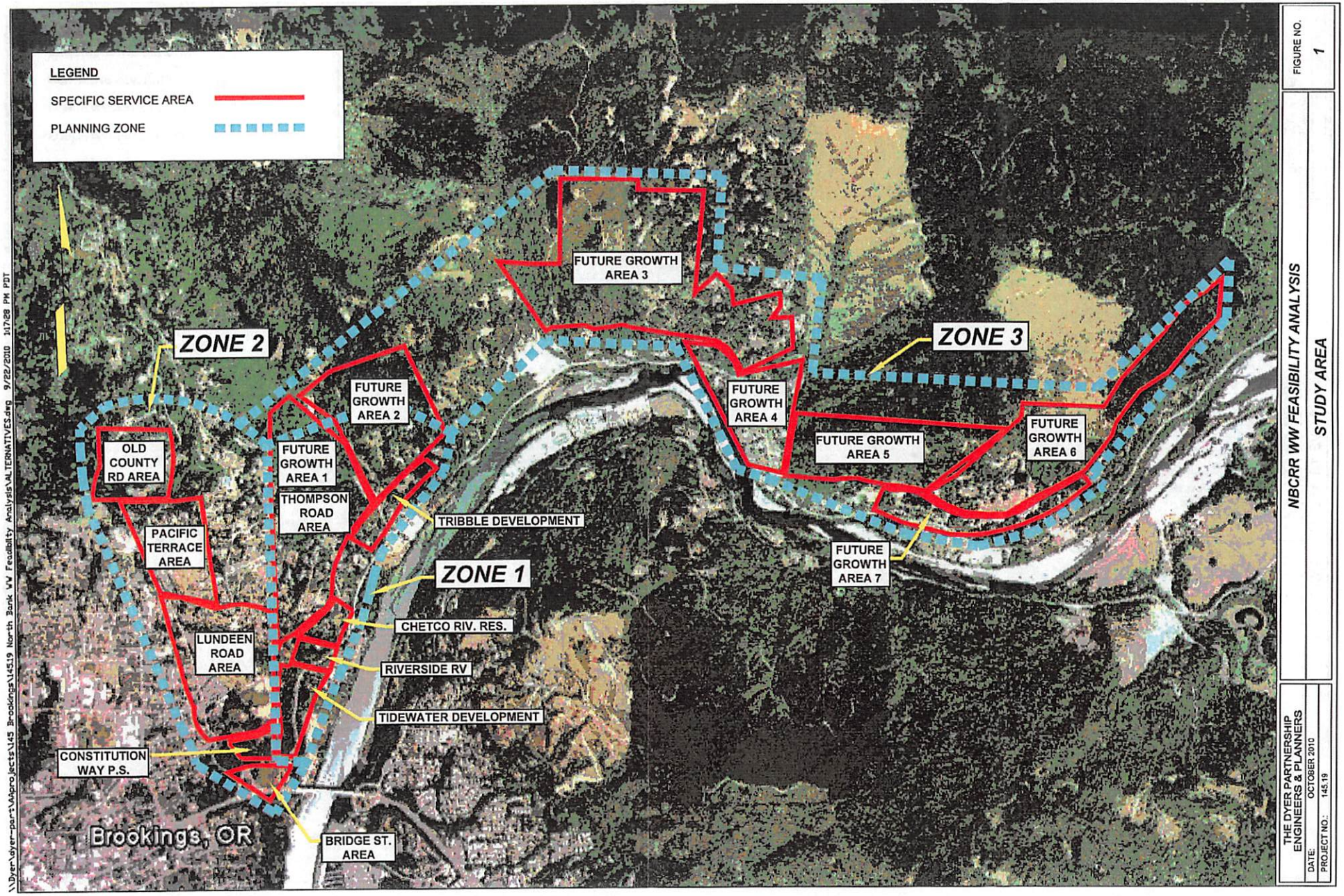
Note that the above allocation method simply divides the recommended alternative's project cost by the number of EDU's (i.e. flow contribution) located in each area. This is but one method of cost allocation. This method does not reflect the cost variation of the local collector gravity sewers and the area's portion of gravity truck lines, pump stations and force main utilization for each service area. It is the case that provision of gravity collector lines to the Lunden Road and Thompson Road areas requires more line length per service connection than is required for the riverside areas such as Tidewater Property, Chetco River Resort, Riverside RV Resort and Tribble Development. Housing density is less on the higher ground locations. However, it may

also be that case that exclusion of locations west and north of NBCRR (higher ground) in an LID might cause the remaining locations east and south of NBCRR (river side) to higher per EDU costs than if the high ground locations were included. This is because pump station and force main sizes could be likely be reduced due to flow velocity requirement constraints. Exclusion of the higher ground locations would leave fewer customers over which to distribute the basic costs.

Differentiation of allocated costs to a greater decree may be performed during the development of a Local Improvement District (LID) Study which is the logical next step if the City concurs with the general project alternative recommendations of the present study and wishes to proceed.

In the LID study, various methods of cost allocation (such as lot areas served, frontage of property served, anticipated flow contribution as well as combinations of these factors at various ratios) can be investigated and a determination made based upon consensus of the City and the participating parties regarding the logic and equity of the allocation method chosen.

FIGURES


LEGEND
SPECIFIC SERVICE AREA
PLANNING ZONE
ZONE 2
ZONE 3
ZONE 1
FUTURE GROWTH AREA 3
FUTURE GROWTH AREA 2
FUTURE GROWTH AREA 1
FUTURE GROWTH AREA 4
FUTURE GROWTH AREA 5
FUTURE GROWTH AREA 6
FUTURE GROWTH AREA 7
OLD COUNTY RD AREA
THOMPSON ROAD AREA
PACIFIC TERRACE AREA
LUNDEEN ROAD AREA
TRIBBLE DEVELOPMENT
CHETCO RIV. RES.
RIVERSIDE RV
TIDEWATER DEVELOPMENT
CONSTITUTION WAY P.S.
BRIDGE ST. AREA
Brookings, OR
NBCRR WW FEASIBILITY ANALYSIS
STUDY AREA
FIGURE NO. 1
THE DYER PARTNERSHIP ENGINEERS & PLANNERS
DATE: OCTOBER 2010
PROJECT NO.: 145.19
\\Dyer\dyer-part\Aprojects\145 Brookings\145.19 North Bank WW Feasibility Analysis\ALTERNATIVES.dwg 9/22/2010 11:20 PM PDT

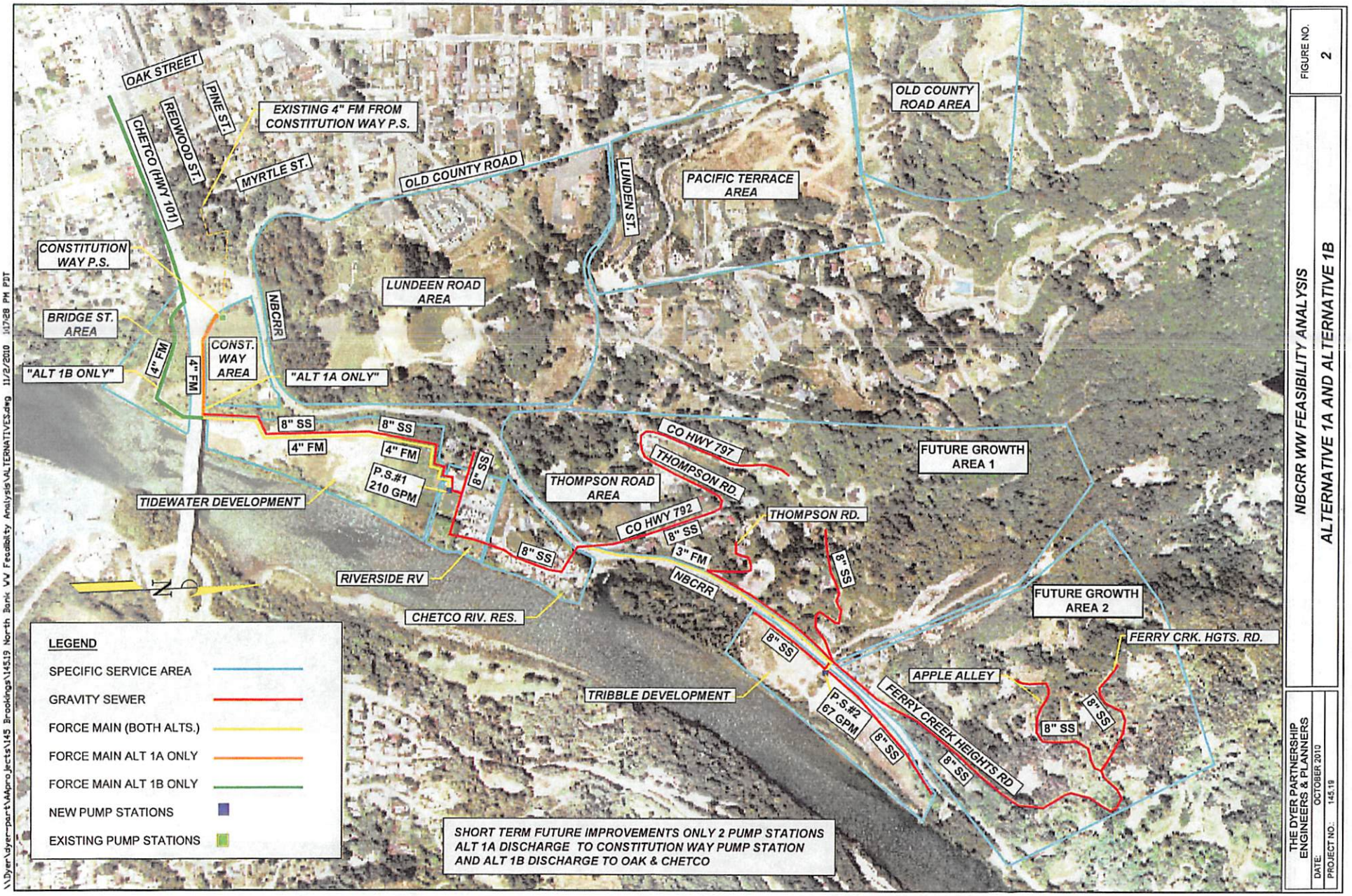


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FIGURE NO. 2

NBCRR WW FEASIBILITY ANALYSIS

ALTERNATIVE 1A AND ALTERNATIVE 1B

THE DYER PARTNERSHIP ENGINEERS & PLANNERS

DATE: OCTOBER 2010

PROJECT NO.: 145.19

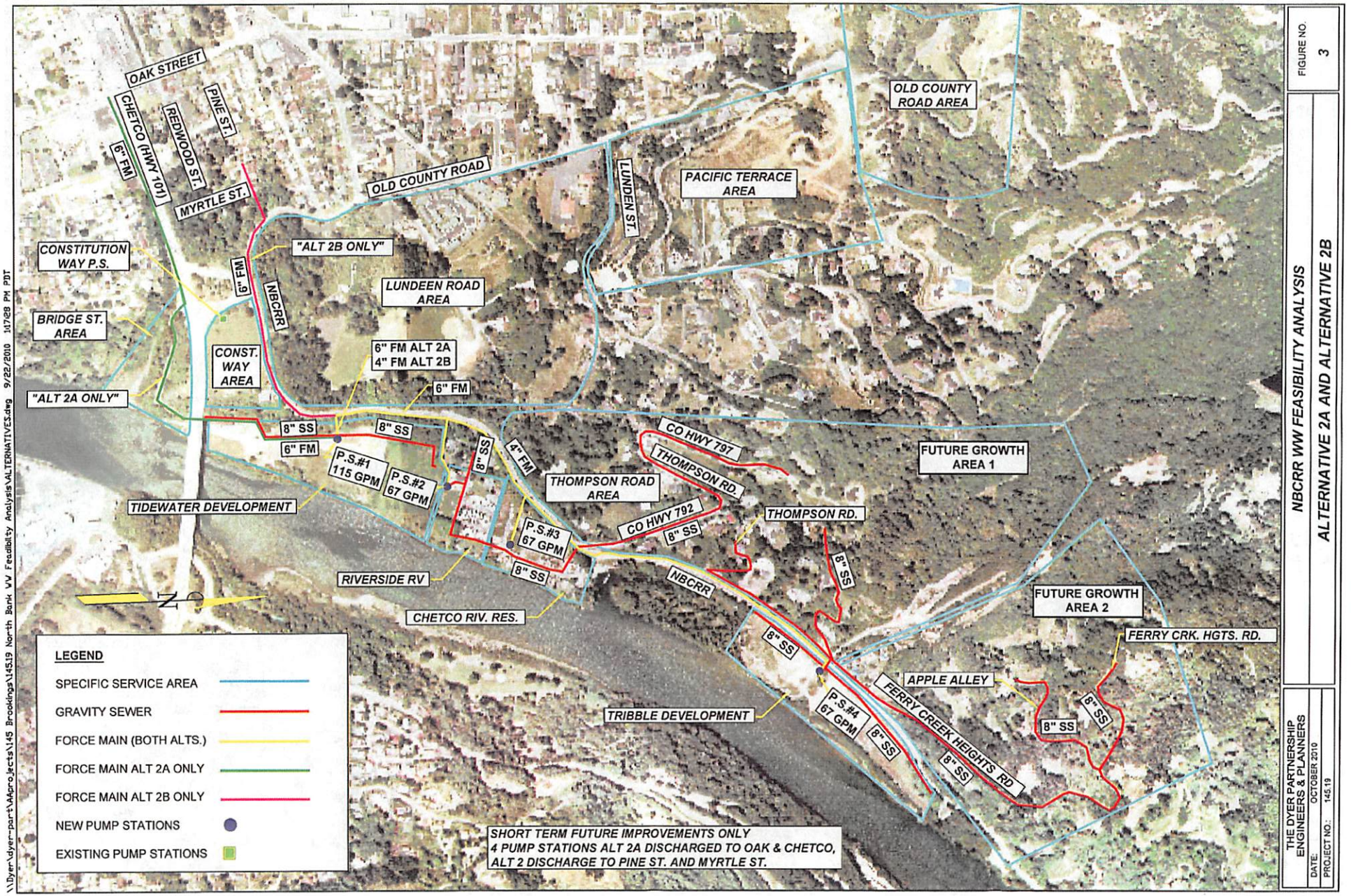

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FIGURE NO. 3

NBCRR WW FEASIBILITY ANALYSIS

ALTERNATIVE 2A AND ALTERNATIVE 2B

THE DYER PARTNERSHIP ENGINEERS & PLANNERS

DATE: OCTOBER 2010

PROJECT NO.: 145.19

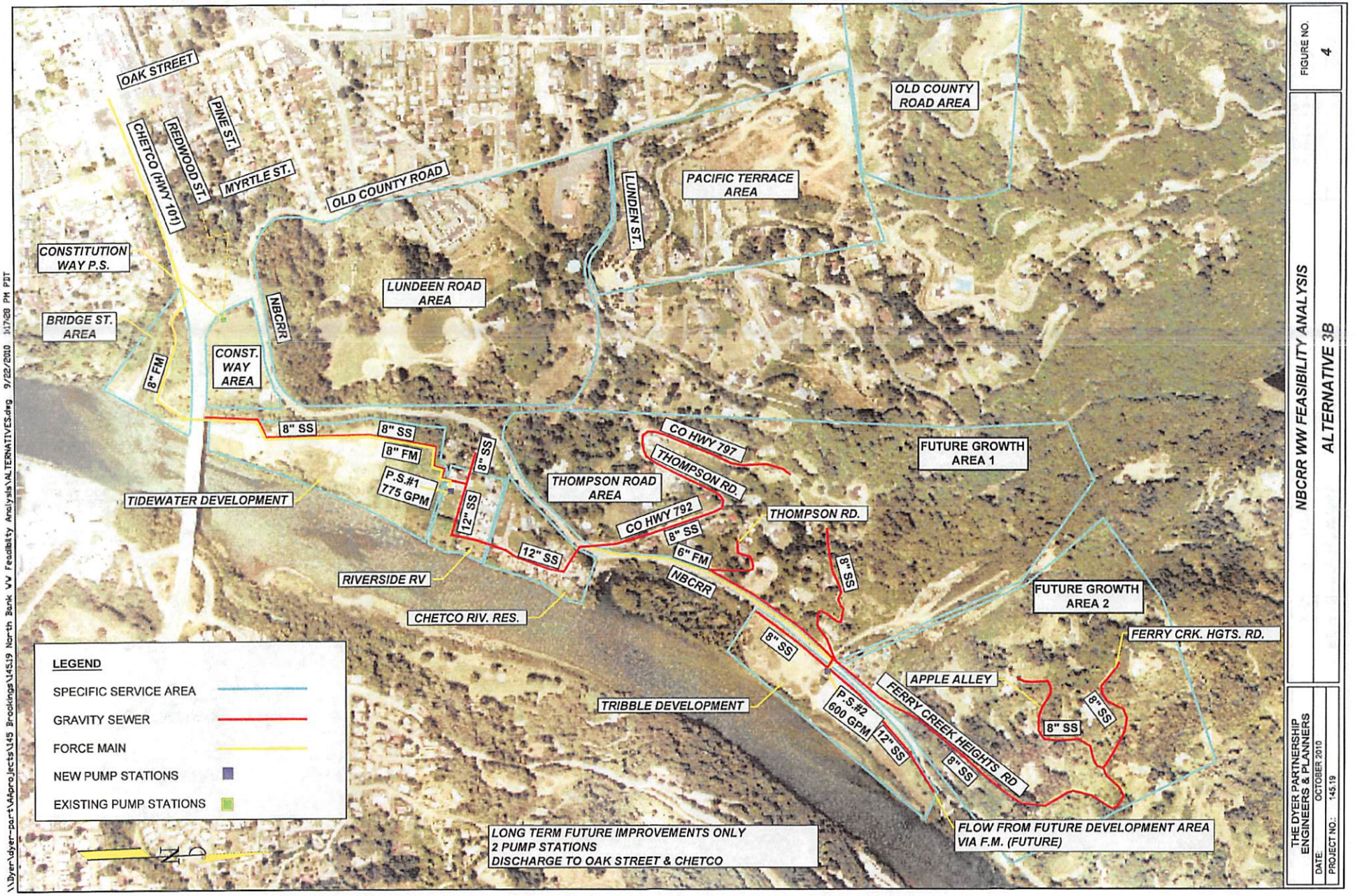

FIGURE NO. 4

NBCRR WW FEASIBILITY ANALYSIS

ALTERNATIVE 3B

THE DYER PARTNERSHIP ENGINEERS & PLANNERS

DATE: OCTOBER 2010

PROJECT NO.: 145.19

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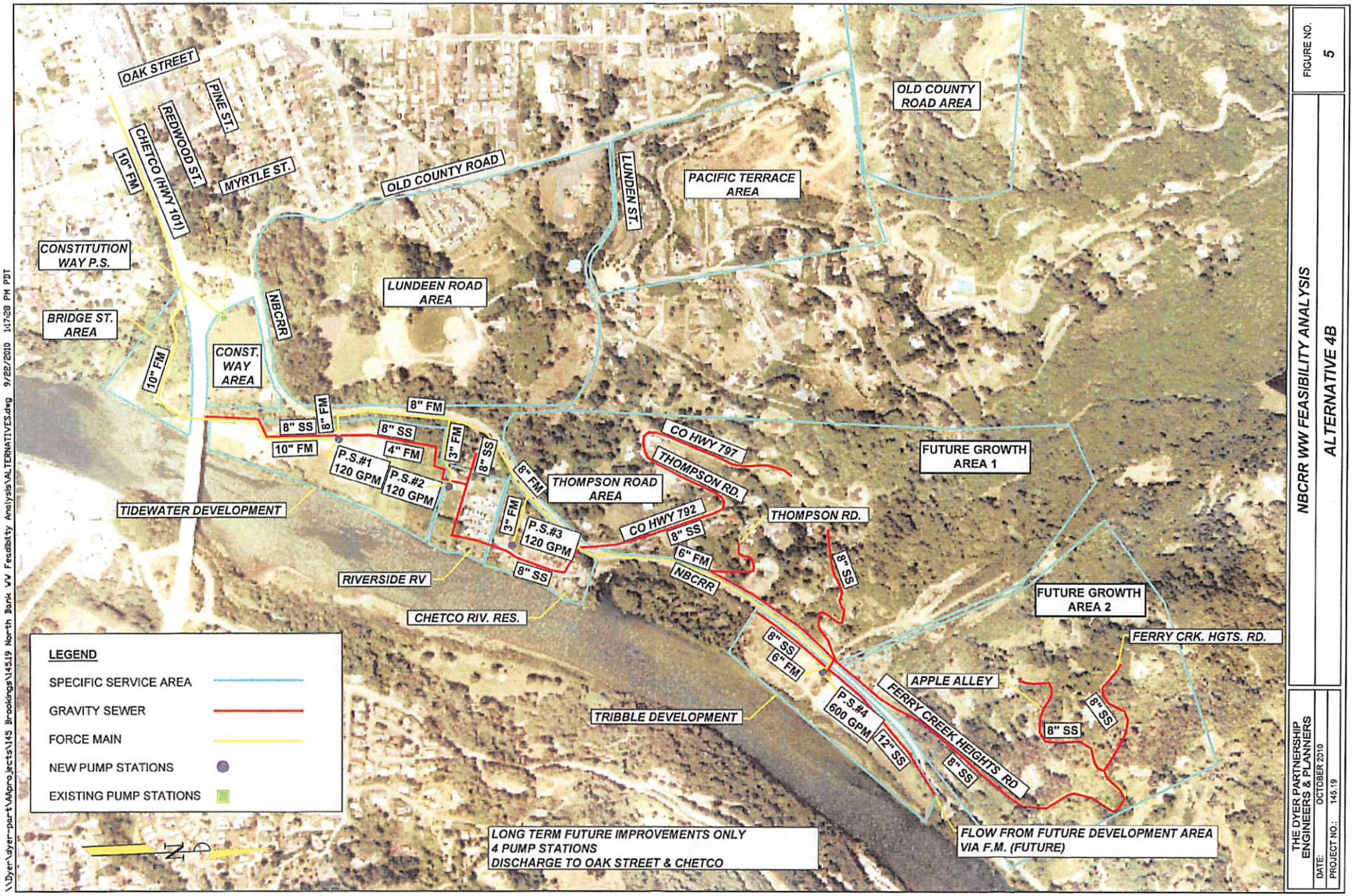

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FIGURE NO. 5

NBCRR WW FEASIBILITY ANALYSIS

ALTERNATIVE 4B

THE DYER PARTNERSHIP ENGINEERS & PLANNERS

DATE: OCTOBER 2010

PROJECT NO.: 145.19

APPENDIX

COSTS

Appendix

A

70 GPM PUMP STATION
Tribble to Gr Sew @ Checto Riv. Res.
TDH = 84'
Pumps & Motors 25.77% eff. Q = 70 gpm; HP = 10
COST ESTIMATE

Item	Description	Unit	Qty	Unit Cost	Total Cost
1	Mobilization, Demob., Ins. Bonds.	LS	1	$ 21,600	$ 21,600
2	Contractor Temp Facilities	LS	1	$ 10,800	$ 10,800
3	Structural excavation and backfill	CY	66	$ 30	$ 1,980
4	Wet well 6' Dia 12' Deep	CY	8	$ 1,600	$ 12,800
5	Grout Bottom to shape slope to pumps	LS	1	$ 600	$ 600
6	Install rail system and bottom elbow	EA	2	$ 2,000	$ 4,000
7	Vault hatch and frame S.S.	EA	1	$ 2,800	$ 2,800
8	Construct top reinf. conc. slab 6' Dia. X 8" thick	CY	1	$ 1,200	$ 1,200
9	Submersible pumps 10 HP	EA	2	$ 8,900	$ 17,800
10	Buried pre-cast conc. valve value 6' x 6' x 6'	EA	1	$ 6,400	$ 6,400
11	Double vault hatch and frame S.S.	EA	1	$ 3,200	$ 3,200
12	New 3" D.I. discharge piping	LF	20	$ 120	$ 2,400
13	Connection to FM	LS	1	$ 300	$ 300
14	Discharge line isolation gate 3" valves	EA	2	$ 500	$ 1,000
15	Discharge line check swing 3" check valve	EA	2	$ 800	$ 1,600
16	Air release valve	EA	1	$ 600	$ 600
17	4" Above ground emergency FM pump connection w/GV	LS	1	$ 2,500	$ 2,500
18	D.I.Fittings	LBS	900	$ 3.75	$ 3,375
19	Electrical power cable and pump cable disconnect box	LS	1	$ 4,100	$ 4,100
20	Pump control panel w/ MCC.	EA	1	$ 10,000	$ 10,000
21	Lift cable and hardware	LS	1	$ 900	$ 900
22	Install level/alarm floats and transducers	LS	1	$ 2,000	$ 2,000
23	Alarm equipment and strobe light	LS	1	$ 1,800	$ 1,800
24	Foundation Stabilization	CY	20	$ 50	$ 1,000
25	Aggregate Base (1"-0")	TN	160	$ 30	$ 4,800
26	Chain Link Fence - 6' high	LF	150	$ 50	$ 7,500
27	Chain Link 14' double gate	EA	1	$ 1,200	$ 1,200
28	Storm Drain Piping	LF	50	$ 25	$ 1,250
29	Pig Launcher Piping & Valves	LS	1	$ 9,500	$ 9,500
30	Exterior Electrical Conduit	LF	150	$ 25	$ 3,750
31	Generator Building	SF	225	$ 200	$ 45,000
32	Generator Materials, Electrical, and Mechanical	EA	1	$ 45,000	$ 45,000
33	Louvers and Dampers	LS	1	$ 3,000	$ 3,000
34	Landscaping	LS	1	$ 2,000	$ 2,000
35	Dewatering	LS	1	$ 5,500	$ 5,500
36	Misc. hardware and construction items	LS	1	$ 2,000	$ 2,000
37	Final clean-up	LS	1	$ 1,500	$ 1,500
38	Close out documents	LS	1	$ 1,200	$ 1,200
	Construction Total				$ 247,955
	Contingency 15%				37,200
	Pre-Design Report				7,500
	Survey and Design				31,000
	Construction Management				7,400
	Construction Inspection				11,200
	Legal, Admin				3,000
				INITIAL CAPITAL COST	$ 345,255

O&M ESTIMATE - ANNUAL

Item	Description	Unit	Qty	Unit Cost	Total Cost	PW
1	Operational Training labor	HRS	6	$ 28	$ 168	
2	Operational Inspection/Testing labor	HRS	52	$ 28	$ 1,456	
3	Maintenance/Repair labor	HRS	72	$ 28	$ 2,016	
6	Misc. Parts - annual repair	LS	1	$ 2,000	$ 2,000	
7	Elec. Power	KWH	3,768	$ 0.08	$ 301	
	OPERATIONS AND MAINTENANCE COSTS				$ 5,941	$ 84,443

	Annual	PW
Initial Capital Cost		$ 345,255
Operations and Maintenance Cost	$ 5,941	$ 84,443
PRESENT WORTH COST OF ALTERNATIVE		$ 429,698

Static	Dynamic	TDH	GPM
60	24	84	70
Hrs/Day	KwH/Year	EFF.	HP
2.4	3,768	0.26	5.8

Find	Given	Given	Given
P	A	n	i
$ 84,443	$ 5,941	20	0.035

120 GPM PUMP STATIONS
Alt 2B PS1; Alt 4B PS 1, 2 & 3
TDHL range 163' to 185'. TDHL ave. = 174'
Pumps & Motors ave 16% eff. Q = 120 gpm; HP = 40
COST ESTIMATE

Item	Description	Unit	Qty	Unit Cost	Total Cost
1	Mobilization, Demob., Ins. Bonds.	LS	1	$ 26,500	$ 26,500
2	Contractor Temp Facilities	LS	1	$ 13,200	$ 13,200
3	Structural excavation and backfill	CY	70	$ 30	$ 2,100
4	Wet well 6' Dia 13' Deep	CY	9	$ 1,600	$ 14,400
5	Grout Bottom to shape slope to pumps	LS	1	$ 600	$ 600
6	Install rail system and bottom elbow	EA	2	$ 2,800	$ 5,600
7	Vault hatch and frame S.S.	EA	1	$ 2,800	$ 2,800
8	Construct top reinf. conc. slab 6' Dia. X 8" thick	CY	1	$ 1,200	$ 1,200
9	Submersible pumps 40 HP	EA	2	$ 25,000	$ 50,000
10	Buried pre-cast conc. valve value 6' x 6' x 6'	EA	1	$ 6,400	$ 6,400
11	Double vault hatch and frame S.S.	EA	1	$ 3,200	$ 3,200
12	New 4" D.I. discharge piping	LF	20	$ 140	$ 2,800
13	Connection to FM	LS	1	$ 300	$ 300
14	Discharge line isolation gate 4" valves	EA	2	$ 700	$ 1,400
15	Discharge line check swing 4" check valve	EA	2	$ 1,250	$ 2,500
16	Air release valve	EA	1	$ 600	$ 600
17	4" Above ground emergency FM pump connection w/GV	LS	1	$ 2,500	$ 2,500
18	D.I.Fittings	LBS	1,100	$ 4	$ 4,125
19	Electrical power cable and disconnect box	LS	1	$ 6,000	$ 6,000
20	Pump control panel w/ MCC.	EA	1	$ 14,000	$ 14,000
21	Lift cable and hardware	LS	1	$ 900	$ 900
22	Install level/alarm floats and transducers	LS	1	$ 2,000	$ 2,000
23	Alarm equipment and strobe light	LS	1	$ 1,800	$ 1,800
24	Foundation Stabilization	CY	20	$ 50	$ 1,000
25	Aggregate Base (1"-0")	TN	160	$ 30	$ 4,800
26	Chain Link Fence - 6' high	LF	150	$ 50	$ 7,500
27	Chain Link 14' double gate	EA	1	$ 1,200	$ 1,200
28	Storm Drain Piping	LF	50	$ 25	$ 1,250
29	Pig Launcher Piping & Valves	LS	1	$ 9,500	$ 9,500
30	Exterior Electrical Conduit	LF	150	$ 25	$ 3,750
31	Generator Building	SF	225	$ 200	$ 45,000
32	Generator Materials, Electrical, and Mechanical	EA	1	$ 50,000	$ 50,000
33	Louvers and Dampers	LS	1	$ 3,000	$ 3,000
34	Landscaping	LS	1	$ 2,000	$ 2,000
35	Dewatering	LS	1	$ 6,000	$ 6,000
36	Misc. hardware and construction items	LS	1	$ 2,000	$ 2,000
37	Final clean-up	LS	1	$ 1,500	$ 1,500
38	Close out documents	LS	1	$ 1,200	$ 1,200
	Construction Total				$ 304,625
	Contingency 15%				45,700
	Pre-Design Report				7,500
	Survey and Design				38,100
	Construction Management				9,100
	Construction Inspection				13,700
	Legal, Admin				3,700
				INITIAL CAPITAL COST	$ 422,425

O&M ESTIMATE - ANNUAL

Item	Description	Unit	Qty	Unit Cost	Total Cost	PW
1	Operational Training labor	HRS	6	$ 28	$ 168	
2	Operational Inspection/Testing labor	HRS	52	$ 28	$ 1,456	
3	Maintenance/Repair labor	HRS	72	$ 28	$ 2,016	
6	Misc. Parts - annual repair	LS	1	$ 3,000	$ 3,000	
7	Elec. Power	KWH	26,941	$ 0.08	$ 2,155	
	OPERATIONS AND MAINTENANCE COSTS				$ 8,795	$ 125,002

	Annual	PW
Initial Capital Cost		$ 422,425
Operations and Maintenance Cost	$ 8,795	$ 125,002
PRESENT WORTH COST OF ALTERNATIVE		$ 547,427

Static	Dynamic	TDH	GPM
NA	NA	174	120
Hrs/Day	KwH/Year	EFF.	HP
3	26,941	0.16	33.0

Find	Given	Given	Given
P	A	n	i
$ 125,002	$ 8,795	20	0.035

120 GPM PUMP STATIONS
Alt 2A PS1-3; Alt 2B PS 2-4
TDHL range 201' to 250'. TDHL ave. = 225'
Pumps & Motors ave 15% eff. Q = 120 gpm; HP = 50
COST ESTIMATE

Item	Description	Unit	Qty	Unit Cost	Total Cost
1	Mobilization, Demob., Ins. Bonds.	LS	1	$ 27,200	$ 27,200
2	Contractor Temp Facilities	LS	1	$ 13,600	$ 13,600
3	Structural excavation and backfill	CY	70	$ 30	$ 2,100
4	Wet well 6' Dia 13' Deep	CY	9	$ 1,600	$ 14,400
5	Grout Bottom to shape slope to pumps	LS	1	$ 600	$ 600
6	Install rail system and bottom elbow	EA	2	$ 2,800	$ 5,600
7	Vault hatch and frame S.S.	EA	1	$ 2,800	$ 2,800
8	Construct top reinf. conc. slab 6' Dia. X 8" thick	CY	1	$ 1,200	$ 1,200
9	Submersible pumps 50 HP	EA	2	$ 28,000	$ 56,000
10	Buried pre-cast conc. valve value 6' x 6' x 6'	EA	1	$ 6,400	$ 6,400
11	Double vault hatch and frame S.S.	EA	1	$ 3,200	$ 3,200
12	New 4" D.I. discharge piping	LF	20	$ 140	$ 2,800
13	Connection to FM	LS	1	$ 300	$ 300
14	Discharge line isolation gate 4" valves	EA	2	$ 700	$ 1,400
15	Discharge line check swing 4" check valve	EA	2	$ 1,250	$ 2,500
16	Air release valve	EA	1	$ 600	$ 600
17	4" Above ground emergency FM pump connection w/GV	LS	1	$ 2,500	$ 2,500
18	D.I.Fittings	LBS	1,100	$ 4	$ 4,125
19	Electrical power cable and disconnect box	LS	1	$ 6,500	$ 6,500
20	Pump control panel w/ MCC.	EA	1	$ 15,000	$ 15,000
21	Lift cable and hardware	LS	1	$ 900	$ 900
22	Install level/alarm floats and transducers	LS	1	$ 2,000	$ 2,000
23	Alarm equipment and strobe light	LS	1	$ 1,800	$ 1,800
24	Foundation Stabilization	CY	20	$ 50	$ 1,000
25	Aggregate Base (1"-0")	TN	160	$ 30	$ 4,800
26	Chain Link Fence - 6' high	LF	150	$ 50	$ 7,500
27	Chain Link 14' double gate	EA	1	$ 1,200	$ 1,200
28	Storm Drain Piping	LF	50	$ 25	$ 1,250
29	Pig Launcher Piping & Valves	LS	1	$ 9,500	$ 9,500
30	Exterior Electrical Conduit	LF	150	$ 25	$ 3,750
31	Generator Building	SF	225	$ 200	$ 45,000
32	Generator Materials, Electrical, and Mechanical	EA	1	$ 50,000	$ 50,000
33	Louvers and Dampers	LS	1	$ 3,000	$ 3,000
34	Landscaping	LS	1	$ 2,000	$ 2,000
35	Dewatering	LS	1	$ 6,000	$ 6,000
36	Misc. hardware and construction items	LS	1	$ 2,000	$ 2,000
37	Final clean-up	LS	1	$ 1,500	$ 1,500
38	Close out documents	LS	1	$ 1,200	$ 1,200
	Construction Total				$ 313,225
	Contingency 15%				47,000
	Pre-Design Report				7,500
	Survey and Design				39,200
	Construction Management				9,400
	Construction Inspection				14,100
	Legal, Admin				3,800
				INITIAL CAPITAL COST	$ 434,225

O&M ESTIMATE - ANNUAL

Item	Description	Unit	Qty	Unit Cost	Total Cost	PW
1	Operational Training labor	HRS	6	$ 28	$ 168	
2	Operational Inspection/Testing labor	HRS	52	$ 28	$ 1,456	
3	Maintenance/Repair labor	HRS	72	$ 28	$ 2,016	
6	Misc. Parts - annual repair	LS	1	$ 3,000	$ 3,000	
7	Elec. Power	KWH	37,160	$ 0.08	$ 2,973	
	OPERATIONS AND MAINTENANCE COSTS				$ 9,613	$ 136,621

	Annual	PW
Initial Capital Cost		$ 434,225
Operations and Maintenance Cost	$ 9,613	$ 136,621
PRESENT WORTH COST OF ALTERNATIVE		$ 570,846

Static	Dynamic	TDH	GPM
NA	NA	225	120
Hrs/Day	KwH/Year	EFF.	HP
3	37,160	0.15	45.5

Find	Given	Given	Given
P	A	n	i
$ 136,621	$ 9,613	20	0.035

120 GPM PUMP STATIONS
Alt 2A PS4
TDHL = 275'
Pumps & Motors 14.77% eff. Q = 120 gpm; HP = 60
COST ESTIMATE

Item	Description	Unit	Qty	Unit Cost	Total Cost
1	Mobilization, Demob., Ins. Bonds.	LS	1	$ 27,800	$ 27,800
2	Contractor Temp Facilities	LS	1	$ 13,900	$ 13,900
3	Structural excavation and backfill	CY	70	$ 30	$ 2,100
4	Wet well 6' Dia 13' Deep	CY	9	$ 1,600	$ 14,400
5	Grout Bottom to shape slope to pumps	LS	1	$ 600	$ 600
6	Install rail system and bottom elbow	EA	2	$ 2,800	$ 5,600
7	Vault hatch and frame S.S.	EA	1	$ 2,800	$ 2,800
8	Construct top reinf. conc. slab 6' Dia. X 8" thick	CY	1	$ 1,200	$ 1,200
9	Submersible pumps 60 HP	EA	2	$ 30,000	$ 60,000
10	Buried pre-cast conc. valve value 6' x 6' x 6'	EA	1	$ 6,400	$ 6,400
11	Double vault hatch and frame S.S.	EA	1	$ 3,200	$ 3,200
12	New 4" D.I. discharge piping	LF	20	$ 140	$ 2,800
13	Connection to FM	LS	1	$ 300	$ 300
14	Discharge line isolation gate 4" valves	EA	2	$ 700	$ 1,400
15	Discharge line check swing 4" check valve	EA	2	$ 1,250	$ 2,500
16	Air release valve	EA	1	$ 600	$ 600
17	4" Above ground emergency FM pump connection w/GV	LS	1	$ 2,500	$ 2,500
18	D.I.Fittings	LBS	1,100	$ 4	$ 4,125
19	Electrical power cable and disconnect box	LS	1	$ 7,000	$ 7,000
20	Pump control panel w/ MCC.	EA	1	$ 16,000	$ 16,000
21	Lift cable and hardware	LS	1	$ 900	$ 900
22	Install level/alarm floats and transducers	LS	1	$ 2,000	$ 2,000
23	Alarm equipment and strobe light	LS	1	$ 1,800	$ 1,800
24	Foundation Stabilization	CY	20	$ 50	$ 1,000
25	Aggregate Base (1"-0")	TN	160	$ 30	$ 4,800
26	Chain Link Fence - 6' high	LF	150	$ 50	$ 7,500
27	Chain Link 14' double gate	EA	1	$ 1,200	$ 1,200
28	Storm Drain Piping	LF	50	$ 25	$ 1,250
29	Pig Launcher Piping & Valves	LS	1	$ 9,500	$ 9,500
30	Exterior Electrical Conduit	LF	150	$ 25	$ 3,750
31	Generator Building	SF	225	$ 200	$ 45,000
32	Generator Materials, Electrical, and Mechanical	EA	1	$ 50,000	$ 50,000
33	Louvers and Dampers	LS	1	$ 3,000	$ 3,000
34	Landscaping	LS	1	$ 2,000	$ 2,000
35	Dewatering	LS	1	$ 6,000	$ 6,000
36	Misc. hardware and construction items	LS	1	$ 2,000	$ 2,000
37	Final clean-up	LS	1	$ 1,500	$ 1,500
38	Close out documents	LS	1	$ 1,200	$ 1,200
	Construction Total				$ 319,625
	Contingency 15%				48,000
	Pre-Design Report				7,500
	Survey and Design				40,000
	Construction Management				9,600
	Construction Inspection				14,400
	Legal, Admin				3,800
				INITIAL CAPITAL COST	$ 442,925

O&M ESTIMATE - ANNUAL

Item	Description	Unit	Qty	Unit Cost	Total Cost	PW
1	Operational Training labor	HRS	6	$ 28	$ 168	
2	Operational Inspection/Testing labor	HRS	52	$ 28	$ 1,456	
3	Maintenance/Repair labor	HRS	72	$ 28	$ 2,016	
6	Misc. Parts - annual repair	LS	1	$ 3,000	$ 3,000	
7	Elec. Power	KWH	46,125	$ 0.08	$ 3,690	
	OPERATIONS AND MAINTENANCE COSTS				$ 10,330	$ 146,814

	Annual	PW
Initial Capital Cost		$ 442,925
Operations and Maintenance Cost	$ 10,330	$ 146,814
PRESENT WORTH COST OF ALTERNATIVE		$ 589,739

Static	Dynamic	TDH	GPM
145	130	275	120
Hrs/Day	KwH/Year	EFF.	HP
3	46,125	0.1477	56.5

Find	Given	Given	Given
P	A	n	i
$ 146,814	$ 10,330	20	0.035

210 GPM PUMP STATIONS
Alt 1A PS1
Assumed Head 110 ' static & 63' Dynamic. TDHL = 173'
Pumps and Motors 26.02% eff. Q = 210 gpm; HP = 40
COST ESTIMATE

Item	Description	Unit	Qty	Unit Cost	Total Cost
1	Mobilization, Demob., Ins. Bonds.	LS	1	$ 28,000	$ 28,000
2	Contractor Temp Facilities	LS	1	$ 7,000	$ 7,000
3	Structural excavation and backfill	CY	70	$ 30	$ 2,100
4	Wet well 6' Dia 13' Deep	CY	14	$ 1,600	$ 22,400
5	Grout Bottom to shape slope to pumps	LS	1	$ 600	$ 600
6	Install rail system and bottom elbow	EA	2	$ 4,000	$ 8,000
7	Vault hatch and frame S.S.	EA	1	$ 2,800	$ 2,800
8	Construct top reinf. conc. slab 6' Dia. X 8" thick	CY	1	$ 1,200	$ 1,200
9	Submersible pumps 60 HP	EA	2	$ 25,000	$ 50,000
10	Buried pre-cast conc. valve value 6' x 6' x 6'	EA	1	$ 6,400	$ 6,400
11	Double vault hatch and frame S.S.	EA	1	$ 3,200	$ 3,200
12	New 4" D.I. discharge piping	LF	20	$ 140	$ 2,800
13	Connection to FM	LS	1	$ 300	$ 300
14	Discharge line isolation gate 4" valves	EA	2	$ 700	$ 1,400
15	Discharge line check swing 4" check valve	EA	2	$ 1,250	$ 2,500
16	Air release valve	EA	1	$ 600	$ 600
17	4" Above ground emergency FM pump connection w/GV	LS	1	$ 2,500	$ 2,500
18	D.I.Fittings	LBS	1,100	$ 4	$ 4,125
19	Electrical power cable and disconnect box	LS	1	$ 6,000	$ 6,000
20	Pump control panel w/ MCC.	EA	1	$ 14,000	$ 14,000
21	Lift cable and hardware	LS	1	$ 900	$ 900
22	Intstall level/alarm floats and transducers	LS	1	$ 2,000	$ 2,000
23	Alarm equipment and strobe light	LS	1	$ 1,800	$ 1,800
24	Foundation Stabilization	CY	20	$ 50	$ 1,000
25	Aggregate Base (1"-0")	TN	160	$ 30	$ 4,800
26	Chain Link Fence - 6' high	LF	150	$ 50	$ 7,500
27	Chain link 14' double gate	EA	1	$ 1,200	$ 1,200
28	Storm Drain Piping	LF	50	$ 25	$ 1,250
29	Pig Launcher Piping & Valves	LS	1	$ 9,500	$ 9,500
30	Exterior Electrical Conduit	LF	150	$ 25	$ 3,750
31	Generator Building	SF	225	$ 200	$ 45,000
32	Generator Materials, Electrical, and Mechanical	EA	1	$ 55,000	$ 55,000
33	Louvers and Dampers	LS	1	$ 3,000	$ 3,000
34	Landscaping	LS	1	$ 2,000	$ 2,000
35	Dewatering	LS	1	$ 6,000	$ 6,000
36	Misc. hardware and construction items	LS	1	$ 2,000	$ 2,000
37	Final clean-up	LS	1	$ 1,500	$ 1,500
38	Close out documents	LS	1	$ 1,200	$ 1,200
	Construction Total				$ 315,325
	Contingency 15%				47,300
	Pre-Design Report				7,500
	Survey and Design				39,400
	Construction Management				9,500
	Construction Inspection				14,200
	Legal, Admin				3,800
				INITIAL CAPITAL COST	$ 437,025

O&M ESTIMATE - ANNUAL

Item	Description	Unit	Qty	Unit Cost	Total Cost	PW
1	Operational Training labor	HRS	6	$ 28	$ 168	
2	Operational Inspection/Testing labor	HRS	52	$ 28	$ 1,456	
3	Maintenance/Repair labor	HRS	90	$ 28	$ 2,520	
6	Misc. Parts - annual repair	LS	1	$ 3,500	$ 3,500	
7	Elec. Power	KWH	28,825	$ 0.08	$ 2,306	
	OPERATIONS AND MAINTENANCE COSTS				$ 9,950	$ 141,413

	Annual	PW
Initial Capital Cost		$ 437,025
Operations and Maintenance Cost	$ 9,950	$ 141,413
PRESENT WORTH COST OF ALTERNATIVE		$ 578,438

Static	Dynamic	TDH	GPM
110	63	173	210
Hrs/Day	KwH/Year	EFF.	HP
3	28,825	0.26	35.3

Find	Given	Given	Given
P	A	n	i
$ 141,413	$ 9,950	20	0.035

210 GPM PUMP STATIONS
Alt 1B PS1
Assumed Head 145 ' static & 106' Dynamic. TDHL = 251'
Pumps and Motors 26.02% eff. Q = 210 gpm; HP = 60
COST ESTIMATE

Item	Description	Unit	Qty	Unit Cost	Total Cost
1	Mobilization, Demob., Ins. Bonds.	LS	1	$ 29,300	$ 29,300
2	Contractor Temp Facilities	LS	1	$ 7,300	$ 7,300
3	Structural excavation and backfill	CY	70	$ 30	$ 2,100
4	Wet well 6' Dia 13' Deep	CY	14	$ 1,600	$ 22,400
5	Grout Bottom to shape slope to pumps	LS	1	$ 600	$ 600
6	Install rail system and bottom elbow	EA	2	$ 4,000	$ 8,000
7	Vault hatch and frame S.S.	EA	1	$ 2,800	$ 2,800
8	Construct top reinf. conc. slab 6' Dia. X 8" thick	CY	1	$ 1,200	$ 1,200
9	Submersible pumps 60 HP	EA	2	$ 30,000	$ 60,000
10	Buried pre-cast conc. valve value 6' x 6' x 6'	EA	1	$ 6,400	$ 6,400
11	Double vault hatch and frame S.S.	EA	1	$ 3,200	$ 3,200
12	New 4" D.I. discharge piping	LF	20	$ 140	$ 2,800
13	Connection to FM	LS	1	$ 300	$ 300
14	Discharge line isolation gate 4" valves	EA	2	$ 700	$ 1,400
15	Discharge line check swing 4" check valve	EA	2	$ 1,250	$ 2,500
16	Air release valve	EA	1	$ 600	$ 600
17	4" Above ground emergency FM pump connection w/GV	LS	1	$ 2,500	$ 2,500
18	D.I.Fittings	LBS	1,100	$ 4	$ 4,125
19	Electrical power cable and disconnect box	LS	1	$ 7,000	$ 7,000
20	Pump control panel w/ MCC.	EA	1	$ 16,000	$ 16,000
21	Lift cable and hardware	LS	1	$ 900	$ 900
22	Intstall level/alarm floats and transducers	LS	1	$ 2,000	$ 2,000
23	Alarm equipment and strobe light	LS	1	$ 1,800	$ 1,800
24	Foundation Stabilization	CY	20	$ 50	$ 1,000
25	Aggregate Base (1"-0")	TN	160	$ 30	$ 4,800
26	Chain Link Fence - 6' high	LF	150	$ 50	$ 7,500
27	Chain link 14' double gate	EA	1	$ 1,200	$ 1,200
28	Storm Drain Piping	LF	50	$ 25	$ 1,250
29	Pig Launcher Piping & Valves	LS	1	$ 9,500	$ 9,500
30	Exterior Electrical Conduit	LF	150	$ 25	$ 3,750
31	Generator Building	SF	225	$ 200	$ 45,000
32	Generator Materials, Electrical, and Mechanical	EA	1	$ 55,000	$ 55,000
33	Louvers and Dampers	LS	1	$ 3,000	$ 3,000
34	Landscaping	LS	1	$ 2,000	$ 2,000
35	Dewatering	LS	1	$ 6,000	$ 6,000
36	Misc. hardware and construction items	LS	1	$ 2,000	$ 2,000
37	Final clean-up	LS	1	$ 1,500	$ 1,500
38	Close out documents	LS	1	$ 1,200	$ 1,200
	Construction Total				$ 329,925
	Contingency 15%				49,500
	Pre-Design Report				7,500
	Survey and Design				41,200
	Construction Management				9,800
	Construction Inspection				14,800
	Legal, Admin				4,000
				INITIAL CAPITAL COST	$ 456,725

O&M ESTIMATE - ANNUAL

Item	Description	Unit	Qty	Unit Cost	Total Cost	PW
1	Operational Training labor	HRS	6	$ 28	$ 168	
2	Operational Inspection/Testing labor	HRS	52	$ 28	$ 1,456	
3	Maintenance/Repair labor	HRS	90	$ 28	$ 2,520	
6	Misc. Parts - annual repair	LS	1	$ 3,500	$ 3,500	
7	Elec. Power	KWH	41,821	$ 0.08	$ 3,346	
	OPERATIONS AND MAINTENANCE COSTS				$ 10,990	$ 156,189

	Annual	PW
Initial Capital Cost		$ 456,725
Operations and Maintenance Cost	$ 10,990	$ 156,189
PRESENT WORTH COST OF ALTERNATIVE		$ 612,914

Static	Dynamic	TDH	GPM
145	106	251	210
Hrs/Day	KwH/Year	EFF.	HP
3	41,821	0.26	51.2

Find	Given	Given	Given
P	A	n	i
$156,189	$ 10,990	20	0.035

600 GPM PUMP STATION
Alt 3B PS 2
Assumed Head 60 ' static & 11' Dynamic. TDHL = 71'
Pumps & Motor 80.23% eff. Q = 600 gpm; HP = 15
COST ESTIMATE

Item	Description	Unit	Qty	Unit Cost	Total Cost
1	Mobilization, Demob., Ins. Bonds.	LS	1	$ 30,000	$ 30,000
2	Contractor Temp Facilities	LS	1	$ 15,000	$ 15,000
3	Structural excavation and backfill	CY	110	$ 30	$ 3,300
4	Wet well 8' Dia 15' Deep	CY	21	$ 1,600	$ 33,600
5	Grout Bottom to shape slope to pumps	LS	1	$ 800	$ 800
6	Install rail system and bottom elbow	EA	2	$ 6,600	$ 13,200
7	Vault hatch and frame S.S.	EA	1	$ 3,250	$ 3,250
8	Construct top reinf. conc. slab 8' Dia. X 8" thick	CY	2	$ 1,200	$ 2,400
9	Submersible pumps 15 HP	EA	2	$ 14,000	$ 28,000
10	Buried pre-cast conc. valve value 6' x 6' x 8'	EA	1	$ 7,800	$ 7,800
11	Double vault hatch and frame S.S.	EA	1	$ 3,700	$ 3,700
12	New 6" D.I. discharge piping	LF	20	$ 160	$ 3,200
13	Connection to FM	LS	1	$ 400	$ 400
14	Discharge line isolation gate 6" valves	EA	2	$ 950	$ 1,900
15	Discharge line check swing 4" check valve	EA	2	$ 1,600	$ 3,200
16	Air release valve	EA	1	$ 700	$ 700
17	4" Above ground emergency FM pump connection w/GV	LS	1	$ 2,500	$ 2,500
18	D.I.Fittings	LBS	1,800	$ 4	$ 6,750
19	Electrical power cable and disconnect box	LS	1	$ 5,200	$ 5,200
20	Pump control panel w/ MCC.	EA	1	$ 11,500	$ 11,500
21	Lift cable and hardware	LS	1	$ 1,500	$ 1,500
22	Install level/alarm floats and transducers	LS	1	$ 2,000	$ 2,000
23	Alarm equipment and strobe light	LS	1	$ 1,800	$ 1,800
24	Foundation Stabilization	CY	20	$ 50	$ 1,000
25	Aggregate Base (1"-0")	TN	160	$ 30	$ 4,800
26	Chain Link Fence - 6' high	LF	150	$ 50	$ 7,500
27	Chain Link 14' double gate	EA	1	$ 1,200	$ 1,200
28	Storm Drain Piping	LF	50	$ 25	$ 1,250
29	Pig Launcher Piping & Valves	LS	1	$ 9,500	$ 9,500
30	Exterior Electrical Conduit	LF	150	$ 25	$ 3,750
31	Generator Building	SF	225	$ 200	$ 45,000
32	Generator Materials, Electrical, and Mechanical	EA	1	$ 70,000	$ 70,000
33	Louvers and Dampers	LS	1	$ 3,000	$ 3,000
34	Landscaping	LS	1	$ 2,000	$ 2,000
35	Dewatering	LS	1	$ 9,000	$ 9,000
36	Misc. hardware and construction items	LS	1	$ 2,000	$ 2,000
37	Final clean-up	LS	1	$ 1,500	$ 1,500
38	Close out documents	LS	1	$ 1,200	$ 1,200
	Construction Total				$ 344,400
	Contingency 15%				52,000
	Pre-Design Report				7,500
	Survey and Design				43,000
	Construction Management				10,300
	Construction Inspection				15,500
	Legal, Admin				4,100
				INITIAL CAPITAL COST	**$ 476,800**

O&M ESTIMATE - ANNUAL

Item	Description	Unit	Qty	Unit Cost	Total Cost	PW
1	Operational Training labor	HRS	8	$ 28	$ 224	
2	Operational Inspection/Testing labor	HRS	52	$ 28	$ 1,456	
3	Maintenance/Repair labor	HRS	110	$ 28	$ 3,080	
6	Misc. Parts - annual repair	LS	1	$ 5,000	$ 5,000	
7	Elec. Power	KWH	10,962	$ 0.08	$ 877	
	OPERATIONS AND MAINTENANCE COSTS				**$ 10,637**	**$ 151,176**

	Annual	PW
Initial Capital Cost		$ 476,800
Operations and Maintenance Cost	$ 10,637	$ 151,176
PRESENT WORTH COST OF ALTERNATIVE		**$ 627,976**

Static	Dynamic	TDH	GPM
60	11	71	600
Hrs/Day	**KwH/Year**	**EFF.**	**HP**
3	10,962	0.8023	13.4

Find	Given	Given	Given
P	A	n	i
$ 151,176	$ 10,637	20	0.035

600 GPM PUMP STATION
Alt 4B PS 4
Assumed Head 145 ' static & 61' Dynamic. TDHL = 206'
Pumps & Motor 64.93% eff. Q = 600 gpm; HP = 60
COST ESTIMATE

Item	Description	Unit	Qty	Unit Cost	Total Cost
1	Mobilization, Demob., Ins. Bonds.	LS	1	$ 33,800	$ 33,800
2	Contractor Temp Facilities	LS	1	$ 16,900	$ 16,900
3	Structural excavation and backfill	CY	110	$ 30	$ 3,300
4	Wet well 8' Dia 15' Deep	CY	21	$ 1,600	$ 33,600
5	Grout Bottom to shape slope to pumps	LS	1	$ 800	$ 800
6	Install rail system and bottom elbow	EA	2	$ 6,600	$ 13,200
7	Vault hatch and frame S.S.	EA	1	$ 3,250	$ 3,250
8	Construct top reinf. conc. slab 8' Dia. X 8" thick	CY	2	$ 1,200	$ 2,400
9	Submersible pumps 60 HP	EA	2	$ 33,000	$ 66,000
10	Buried pre-cast conc. valve value 6' x 6' x 8'	EA	1	$ 7,800	$ 7,800
11	Double vault hatch and frame S.S.	EA	1	$ 3,700	$ 3,700
12	New 6" D.I. discharge piping	LF	20	$ 160	$ 3,200
13	Connection to FM	LS	1	$ 400	$ 400
14	Discharge line isolation gate 6" valves	EA	2	$ 950	$ 1,900
15	Discharge line check swing 4" check valve	EA	2	$ 1,600	$ 3,200
16	Air release valve	EA	1	$ 700	$ 700
17	4" Above ground emergency FM pump connection w/GV	LS	1	$ 2,500	$ 2,500
18	D.I.Fittings	LBS	1,800	$ 4	$ 6,750
19	Electrical power cable and disconnect box	LS	1	$ 7,000	$ 7,000
20	Pump control panel w/ MCC.	EA	1	$ 16,000	$ 16,000
21	Lift cable and hardware	LS	1	$ 1,500	$ 1,500
22	Install level/alarm floats and transducers	LS	1	$ 2,000	$ 2,000
23	Alarm equipment and strobe light	LS	1	$ 1,800	$ 1,800
24	Foundation Stabilization	CY	20	$ 50	$ 1,000
25	Aggregate Base (1"-0")	TN	160	$ 30	$ 4,800
26	Chain Link Fence - 6' high	LF	150	$ 50	$ 7,500
27	Chain Link 14' double gate	EA	1	$ 1,200	$ 1,200
28	Storm Drain Piping	LF	50	$ 25	$ 1,250
29	Pig Launcher Piping & Valves	LS	1	$ 9,500	$ 9,500
30	Exterior Electrical Conduit	LF	150	$ 25	$ 3,750
31	Generator Building	SF	225	$ 200	$ 45,000
32	Generator Materials, Electrical, and Mechanical	EA	1	$ 70,000	$ 70,000
33	Louvers and Dampers	LS	1	$ 3,000	$ 3,000
34	Landscaping	LS	1	$ 2,000	$ 2,000
35	Dewatering	LS	1	$ 9,000	$ 9,000
36	Misc. hardware and construction items	LS	1	$ 2,000	$ 2,000
37	Final clean-up	LS	1	$ 1,500	$ 1,500
38	Close out documents	LS	1	$ 1,200	$ 1,200
	Construction Total				$ 394,400
	Contingency 15%				58,200
	Pre-Design Report				7,500
	Survey and Design				48,600
	Construction Management				11,700
	Construction Inspection				17,500
	Legal, Admin				4,700
				INITIAL CAPITAL COST	$ 542,600

O&M ESTIMATE - ANNUAL

Item	Description	Unit	Qty	Unit Cost	Total Cost	PW
1	Operational Training labor	HRS	8	$ 28	$ 224	
2	Operational Inspection/Testing labor	HRS	52	$ 28	$ 1,456	
3	Maintenance/Repair labor	HRS	110	$ 28	$ 3,080	
6	Misc. Parts - annual repair	LS	1	$ 5,000	$ 5,000	
7	Elec. Power	KWH	46,453	$ 0.08	$ 3,716	
	OPERATIONS AND MAINTENANCE COSTS				$ 13,476	$ 191,530

	Annual	PW
Initial Capital Cost		$ 542,600
Operations and Maintenance Cost	$ 13,476	$ 191,530
PRESENT WORTH COST OF ALTERNATIVE		$ 734,130

Static	Dynamic	TDH	GPM
145	61	206	600
Hrs/Day	KwH/Year	EFF.	HP
3	46,453	0.6493	56.9

Find	Given	Given	Given
P	A	n	i
$ 191,530	$ 13,476	20	0.035

775 GPM PUMP STATIONS
Alt 3B PS 1
Assumed Head 145 ' static & 41' Dynamic. TDHL = 186'
Pumps & Motors 63% eff. Q = 775 gpm; HP = 60
COST ESTIMATE

Item	Description	Unit	Qty	Unit Cost	Total Cost
1	Mobilization, Demob., Ins. Bonds.	LS	1	$ 37,000	$ 37,000
2	Contractor Temp Facilities	LS	1	$ 18,300	$ 18,300
3	Structural excavatioin and backfill	CY	145	$ 30	$ 4,350
4	Wet well 10' Dia 15' Deep	CY	26	$ 1,600	$ 41,600
5	Grout Bottom to shape slope to pumps	LS	1	$ 800	$ 800
6	Install rail system and bottom elbow	EA	2	$ 6,600	$ 13,200
7	Vault hatch and frame S.S.	EA	1	$ 3,250	$ 3,250
8	Construct top reinf. conc. slab 10' Dia. X 8" thick	CY	3	$ 1,200	$ 3,000
9	Submersible pumps 60 HP	EA	2	$ 35,000	$ 70,000
10	Buried pre-cast conc. valve value 6' x 8' x 10'	EA	1	$ 10,500	$ 10,500
11	Double vault hatch and frame S.S.	EA	1	$ 4,000	$ 4,000
12	New 8" D.I. discharge piping	LF	20	$ 190	$ 3,800
13	Connection to FM	LS	1	$ 450	$ 450
14	Discharge line isolation gate 8" valves	EA	2	$ 1,250	$ 2,500
15	Discharge line check swing 8" check valve	EA	2	$ 2,100	$ 4,200
16	Air release valve	EA	1	$ 700	$ 700
17	4" Above ground emergency FM pump connection w/GV	LS	1	$ 2,500	$ 2,500
18	D.I.Fittings	LBS	2,300	$ 4	$ 8,625
19	Electrical power cable and disconnect box	LS	1	$ 7,000	$ 7,000
20	Pump control panel w/ MCC.	EA	1	$ 17,000	$ 17,000
21	Lift cable and hardware	LS	1	$ 1,500	$ 1,500
22	Install level/alarm floats and transducers	LS	1	$ 2,000	$ 2,000
23	Alarm equipment and strobe light	LS	1	$ 1,800	$ 1,800
24	Foundation Stabilization	CY	20	$ 50	$ 1,000
25	Aggregate Base (1"-0")	TN	160	$ 30	$ 4,800
26	Chain Link Fence - 6' high	LF	150	$ 50	$ 7,500
27	Chanl Link 14'double gate	EA	1	$ 1,200	$ 1,200
28	Storm Drain Piping	LF	50	$ 25	$ 1,250
29	Pig Laucher Piping & Valves	LS	1	$ 9,500	$ 9,500
30	Exterior Electrical Conduit	LF	150	$ 25	$ 3,750
31	Generator Building	SF	225	$ 200	$ 45,000
32	Generator Materials, Electrical, and Mechanical	EA	1	$ 70,000	$ 70,000
33	Louvers and Dampers	LS	1	$ 3,000	$ 3,000
34	Landscaping	LS	1	$ 2,000	$ 2,000
35	Dewatering	LS	1	$ 10,000	$ 10,000
36	Misc. hardware and constrution items	LS	1	$ 2,000	$ 2,000
37	Final clean-up	LS	1	$ 1,500	$ 1,500
38	Close out documents	LS	1	$ 1,200	$ 1,200
	Construction Total				$ 421,775
	Contingency 15%				63,300
	Survey and Design				52
	Pre-Design Report				7,500
	Construction Management				12,300
	Construction Inspection				18,400
	Legal, Admin				4,900
				INITIAL CAPITAL COST	$ 528,227

O&M ESTIMATE - ANNUAL

Item	Description	Unit	Qty	Unit Cost	Total Cost	PW
1	Operational Training labor	HRS	8	$ 28	$ 224	
2	Operational Inspection/Testing labor	HRS	52	$ 28	$ 1,456	
3	Maintenance/Repair labor	HRS	110	$ 28	$ 3,080	
6	Misc. Parts - annual repair	LS	1	$ 5,000	$ 5,000	
7	Elec. Power	KWH	47,237	$ 0.08	$ 3,779	
	OPERATIONS AND MAINTENANCE COSTS				$ 13,539	$ 192,421

	Annual	PW
Initial Capital Cost		$ 528,227
Operations and Maintenance Cost	$ 13,539	$ 192,421
PRESENT WORTH COST OF ALTERNATIVE		$ 720,648

Static	Dynamic	TDH	GPM
145	41	186	775
Hrs/Day	**KwH/Year**	**EFF.**	**HP**
3	47,237	0.63	57.8

Find	Given	Given	Given
P	A	n	i
$192,421	$ 13,539	20	0.035

O&M Costs for Gravity Sewer and Force Mains

Force Main Item	Manhours	Manhour Cost/Hr	Material Multiplier	Base Length Ft	Year Interval	Annual Cost/Ft
Line Pigging FM	4	28	1.15	5000	5	$0.01
Valves Maintenance	6	28	20	2000	20	$0.08
Leak Repair	10	28	1.3	20000	2	$0.01
Street Repair	10	28	15	70000	2	$0.03
					Total	$0.13
Gravity Line Item						
Sew. Flushing & Cleaning	10	28	2	5000	3	$0.04
Manhole Repair	4	28	1.8	350	12	$0.05
Leak Repair	10	28	4	20000	2	$0.03
Street Repair	10	28	15	70000	2	$0.03
					Total	$0.14

8" Gravity Sewer in Roadway

No.	Description	Quantity	Unit	Unit Cost	Item Cost
1	Construction Facilities And Temporary Controls	All	LS	$9,400.00	$9,400
2	Temporary Protection and Direction of Traffic	All	LS	$4,000.00	$4,000
3	Flaggers	150	HR	$50.00	$7,500
4	Misc. Demolition and Site Preparation	All	LS	$4,000.00	$4,000
5	Foundation Stabilization	30	CY	$50.00	$1,500
6	Rock Excavation	50	CY	$100.00	$5,000
7	AC Pavement Removal & Replacement	850	LF	$20.00	$17,000
8	8" Sewerline - 8'-10' Class IV Backfill	1000	LF	$80.00	$80,000
9	Manholes 8'-10'	3	Each	$2,000.00	$6,000

Total Construction Cost	$134,400
Engineering	$24,192
Contingency	$23,824
Legal & Administration	$6,000
Total Project Cost	**$188,416**
Cost per Foot	**$188**

8" Gravity Sewer Not in Roadway

No.	Description	Quantity	Unit	Unit Cost	Item Cost
1	Construction Facilities And Temporary Controls	All	LS	$5,800.00	$5,800
2	Temporary Protection and Direction of Traffic	All	LS	$500.00	$500
3	Misc. Demolition and Site Preparation	All	LS	$4,000.00	$4,000
4	Foundation Stabilization	30	CY	$50.00	$1,500
5	Rock Excavation	50	CY	$100.00	$5,000
6	8" Sewerline 8'-10' - Class III Backfill	1000	LF	$60.00	$60,000
7	Manholes 8'-10'	3	Each	$2,000.00	$6,000

Total Construction Cost	$82,800
Engineering	$14,904
Contingency	$14,691
Legal & Administration	$2,000
Total Project Cost	**$114,395**
Cost per Foot	**$114**

12" Gravity Sewer in Roadway

No.	Description	Quantity	Unit	Unit Cost	Item Cost
1	Construction Facilities And Temporary Controls	All	LS	$10,500.00	$10,500
2	Temporary Protection and Direction of Traffic	All	LS	$4,000.00	$4,000
3	Flaggers	150	HR	$50.00	$7,500
4	Misc. Demolition and Site Preparation	All	LS	$4,000.00	$4,000
5	Foundation Stabilization	30	CY	$50.00	$1,500
6	Rock Excavation	50	CY	$100.00	$5,000
7	AC Pavement Removal & Replacement	850	LF	$20.00	$17,000
8	12" Sewerline - 8'-10' Class IV Backfill	1000	LF	$95.00	$95,000
9	Manholes 8'-10'	3	Each	$2,100.00	$6,300

Total Construction Cost	$150,800
Engineering	$27,144
Contingency	$26,727
Legal & Administration	$6,000
Total Project Cost	**$210,671**
Cost per Foot	**$211**

12" Gravity Sewer Not in Roadway

No.	Description	Quantity	Unit	Unit Cost	Item Cost
1	Construction Facilities And Temporary Controls	All	LS	$6,900.00	$6,900
2	Temporary Protection and Direction of Traffic	All	LS	$500.00	$500
3	Misc. Demolition and Site Preparation	All	LS	$4,000.00	$4,000
4	Foundation Stabilization	30	CY	$50.00	$1,500
5	Rock Excavation	50	CY	$100.00	$5,000
6	12" Sewerline 8'-10' - Class III Backfill	1000	LF	$75.00	$75,000
7	Manholes 8'-10'	3	Each	$2,100.00	$6,300

Total Construction Cost	$99,200
Engineering	$17,856
Contingency	$17,593
Legal & Administration	$2,000
Total Project Cost	**$136,649**
Cost per Foot	**$137**

3" Force Main in Roadway

No.	Description	Quantity	Unit	Unit Cost	Item Cost
1	Construction Facilities And Temporary Controls	All	LS	$5,400.00	$5,400
2	Temporary Protection and Direction of Traffic	All	LS	$3,000.00	$3,000
3	Flaggers	120	HR	$50.00	$6,000
4	Misc. Demolition and Site Preparation	All	LS	$2,000.00	$2,000
5	Foundation Stabilization	30	CY	$50.00	$1,500
6	Rock Excavation	20	CY	$100.00	$2,000
7	AC Pavement Removal & Replacement	850	LF	$20.00	$17,000
8	3" Forcemain Class IV Backfill	1000	LF	$40.00	$40,000

Total Construction Cost	$76,900
Engineering	$13,842
Contingency	$13,646
Legal & Administration	$5,000
Total Project Cost	**$109,388**
Cost per Foot	**$109**

3" Force Main Common w/ Gravity Sewer

No.	Description	Quantity	Unit	Unit Cost	Item Cost
1	Construction Facilities And Temporary Controls	All	LS	$3,000.00	$3,000
2	Temporary Protection and Direction of Traffic	All	LS	$0.00	$0
3	Flaggers	0	HR	$50.00	$0
4	Misc. Demolition and Site Preparation	All	LS	$0.00	$0
5	Foundation Stabilization	0	CY	$50.00	$0
6	Rock Excavation	0	CY	$100.00	$0
7	AC Pavement Removal & Replacement	0	LF	$20.00	$0
8	3" Forcemain Class IV Backfill	1000	LF	$40.00	$40,000

Total Construction Cost	$43,000
Engineering	$7,740
Contingency	$7,646
Legal & Administration	$5,000
Total Project Cost	**$63,386**
Cost per Foot	**$63**

3" Force Main Not in Roadway

No.	Description	Quantity	Unit	Unit Cost	Item Cost
1	Construction Facilities And Temporary Controls	All	LS	$2,600.00	$2,600
2	Temporary Protection and Direction of Traffic	All	LS	$500.00	$500
3	Misc. Demolition and Site Preparation	All	LS	$2,000.00	$2,000
4	Foundation Stabilization	30	CY	$50.00	$1,500
5	Rock Excavation	50	CY	$100.00	$5,000
6	8" Sewerline 8'-10' - Class III Backfill	1000	LF	$25.00	$25,000
	Total Construction Cost				$36,600
	Engineering				$6,588
	Contingency				$6,513
	Legal & Administration				$1,500
	Total Project Cost				**$51,201**
	Cost per Foot				**$51**

4" Force Main in Roadway

No.	Description	Quantity	Unit	Unit Cost	Item Cost
1	Construction Facilities And Temporary Controls	All	LS	$5,800.00	$5,800
2	Temporary Protection and Direction of Traffic	All	LS	$3,000.00	$3,000
3	Flaggers	120	HR	$50.00	$6,000
4	Misc. Demolition and Site Preparation	All	LS	$2,000.00	$2,000
5	Foundation Stabilization	30	CY	$50.00	$1,500
6	Rock Excavation	20	CY	$100.00	$2,000
7	AC Pavement Removal & Replacement	850	LF	$20.00	$17,000
8	4" Forcemain Class IV Backfill	1000	LF	$46.00	$46,000
	Total Construction Cost				$83,300
	Engineering				$14,994
	Contingency				$14,779
	Legal & Administration				$5,000
	Total Project Cost				**$118,073**
	Cost per Foot				**$118**

4" Force Main Common w/ Gravity Sewer

No.	Description	Quantity	Unit	Unit Cost	Item Cost
1	Construction Facilities And Temporary Controls	All	LS	$3,500.00	$3,500
2	Temporary Protection and Direction of Traffic	All	LS	$0.00	$0
3	Flaggers	0	HR	$50.00	$0
4	Misc. Demolition and Site Preparation	All	LS	$0.00	$0
5	Foundation Stabilization	0	CY	$50.00	$0
6	Rock Excavation	0	CY	$100.00	$0
7	AC Pavement Removal & Replacement	0	LF	$20.00	$0
8	4" Forcemain Class IV Backfill	1000	LF	$46.00	$46,000
	Total Construction Cost				$49,500
	Engineering				$8,910
	Contingency				$8,797
	Legal & Administration				$5,000
	Total Project Cost				**$72,207**
	Cost per Foot				**$72**

4" Force Main Not in Roadway

No.	Description	Quantity	Unit	Unit Cost	Item Cost
1	Construction Facilities And Temporary Controls	All	LS	$3,000.00	$3,000
2	Temporary Protection and Direction of Traffic	All	LS	$500.00	$500
3	Misc. Demolition and Site Preparation	All	LS	$2,000.00	$2,000
4	Foundation Stabilization	30	CY	$50.00	$1,500
5	Rock Excavation	50	CY	$100.00	$5,000
6	4" Sewerline 8'-10' - Class III Backfill	1000	LF	$31.00	$31,000

Total Construction Cost	$43,000
Engineering	$7,740
Contingency	$7,646
Legal & Administration	$1,500
Total Project Cost	**$59,886**
Cost per Foot	**$60**

6" Force Main in Roadway

No.	Description	Quantity	Unit	Unit Cost	Item Cost
1	Construction Facilities And Temporary Controls	All	LS	$6,200.00	$6,200
2	Temporary Protection and Direction of Traffic	All	LS	$3,000.00	$3,000
3	Flaggers	120	HR	$50.00	$6,000
4	Misc. Demolition and Site Preparation	All	LS	$2,000.00	$2,000
5	Foundation Stabilization	30	CY	$50.00	$1,500
6	Rock Excavation	20	CY	$100.00	$2,000
7	AC Pavement Removal & Replacement	850	LF	$20.00	$17,000
8	6" Forcemain Class IV Backfill	1000	LF	$52.00	$52,000

Total Construction Cost	$89,700
Engineering	$16,146
Contingency	$15,912
Legal & Administration	$5,000
Total Project Cost	**$126,758**
Cost per Foot	**$127**

6" Force Main Common w/ Gravity Sewer

No.	Description	Quantity	Unit	Unit Cost	Item Cost
1	Construction Facilities And Temporary Controls	All	LS	$3,900.00	$3,900
2	Temporary Protection and Direction of Traffic	All	LS	$0.00	$0
3	Flaggers	0	HR	$50.00	$0
4	Misc. Demolition and Site Preparation	All	LS	$0.00	$0
5	Foundation Stabilization	0	CY	$50.00	$0
6	Rock Excavation	0	CY	$100.00	$0
7	AC Pavement Removal & Replacement	0	LF	$20.00	$0
8	6" Forcemain Class IV Backfill	1000	LF	$52.00	$52,000

Total Construction Cost	$55,900
Engineering	$10,062
Contingency	$9,929
Legal & Administration	$5,000
Total Project Cost	**$80,891**
Cost per Foot	**$81**

6" Force Main Not in Roadway

No.	Description	Quantity	Unit	Unit Cost	Item Cost
1	Construction Facilities And Temporary Controls	All	LS	$3,500.00	$3,500
2	Temporary Protection and Direction of Traffic	All	LS	$500.00	$500
3	Misc. Demolition and Site Preparation	All	LS	$2,000.00	$2,000
4	Foundation Stabilization	30	CY	$50.00	$1,500
5	Rock Excavation	50	CY	$100.00	$5,000
6	6" Sewerline 8'-10' - Class III Backfill	1000	LF	$37.00	$37,000

Total Construction Cost	$49,500
Engineering	$8,910
Contingency	$8,797
Legal & Administration	$1,500
Total Project Cost	**$68,707**
Cost per Foot	**$69**

8" Force Main in Roadway

No.	Description	Quantity	Unit	Unit Cost	Item Cost
1	Construction Facilities And Temporary Controls	All	LS	$6,700.00	$6,700
2	Temporary Protection and Direction of Traffic	All	LS	$3,000.00	$3,000
3	Flaggers	120	HR	$50.00	$6,000
4	Misc. Demolition and Site Preparation	All	LS	$2,000.00	$2,000
5	Foundation Stabilization	30	CY	$50.00	$1,500
6	Rock Excavation	20	CY	$100.00	$2,000
7	AC Pavement Removal & Replacement	850	LF	$20.00	$17,000
8	8" Forcemain Class IV Backfill	1000	LF	$58.00	$58,000

Total Construction Cost	$96,200
Engineering	$17,316
Contingency	$17,062
Legal & Administration	$5,000
Total Project Cost	**$135,578**
Cost per Foot	**$136**

8" Force Main Common w/ Gravity Sewer

No.	Description	Quantity	Unit	Unit Cost	Item Cost
1	Construction Facilities And Temporary Controls	All	LS	$4,400.00	$4,400
2	Temporary Protection and Direction of Traffic	All	LS	$0.00	$0
3	Flaggers	0	HR	$50.00	$0
4	Misc. Demolition and Site Preparation	All	LS	$0.00	$0
5	Foundation Stabilization	0	CY	$50.00	$0
6	Rock Excavation	0	CY	$100.00	$0
7	AC Pavement Removal & Replacement	0	LF	$20.00	$0
8	8" Forcemain Class IV Backfill	1000	LF	$58.00	$58,000

Total Construction Cost	$62,400
Engineering	$11,232
Contingency	$11,080
Legal & Administration	$5,000
Total Project Cost	**$89,712**
Cost per Foot	**$90**

8" Force Main Not in Roadway

No.	Description	Quantity	Unit	Unit Cost	Item Cost
1	Construction Facilities And Temporary Controls	All	LS	$3,900.00	$3,900
2	Temporary Protection and Direction of Traffic	All	LS	$500.00	$500
3	Misc. Demolition and Site Preparation	All	LS	$2,000.00	$2,000
4	Foundation Stabilization	30	CY	$50.00	$1,500
5	Rock Excavation	50	CY	$100.00	$5,000
6	8" Sewerline 8'-10' - Class III Backfill	1000	LF	$43.00	$43,000

Total Construction Cost	$55,900
Engineering	$10,062
Contingency	$9,929
Legal & Administration	$1,500
Total Project Cost	**$77,391**
Cost per Foot	**$77**

10" Force Main in Roadway

No.	Description	Quantity	Unit	Unit Cost	Item Cost
1	Construction Facilities And Temporary Controls	All	LS	$7,705.00	$7,705
2	Temporary Protection and Direction of Traffic	All	LS	$3,450.00	$3,450
3	Flaggers	138	HR	$50.00	$6,900
4	Misc. Demolition and Site Preparation	All	LS	$2,300.00	$2,300
5	Foundation Stabilization	34.5	CY	$50.00	$1,725
6	Rock Excavation	23	CY	$100.00	$2,300
7	AC Pavement Removal & Replacement	977.5	LF	$20.00	$19,550
8	8" Forcemain Class IV Backfill	1000	LF	$66.70	$66,700

Total Construction Cost	$110,630
Engineering	$19,913
Contingency	$19,619
Legal & Administration	$5,000
Total Project Cost	**$155,162**
Cost per Foot	**$155**

10" Force Main Common w/ Gravity Sewer

No.	Description	Quantity	Unit	Unit Cost	Item Cost
1	Construction Facilities And Temporary Controls	All	LS	$5,060.00	$5,060
2	Temporary Protection and Direction of Traffic	All	LS	$0.00	$0
3	Flaggers	0	HR	$50.00	$0
4	Misc. Demolition and Site Preparation	All	LS	$0.00	$0
5	Foundation Stabilization	0	CY	$50.00	$0
6	Rock Excavation	0	CY	$100.00	$0
7	AC Pavement Removal & Replacement	0	LF	$20.00	$0
8	8" Forcemain Class IV Backfill	1000	LF	$66.70	$66,700

Total Construction Cost	$71,760
Engineering	$12,917
Contingency	$12,737
Legal & Administration	$5,000
Total Project Cost	**$102,413**
Cost per Foot	**$102**

10" Force Main Not in Roadway

No.	Description	Quantity	Unit	Unit Cost	Item Cost
1	Construction Facilities And Temporary Controls	All	LS	$4,485.00	$4,485
2	Temporary Protection and Direction of Traffic	All	LS	$575.00	$575
3	Misc. Demolition and Site Preparation	All	LS	$2,300.00	$2,300
4	Foundation Stabilization	34.5	CY	$50.00	$1,725
5	Rock Excavation	57.5	CY	$100.00	$5,750
6	8" Sewerline 8'-10' - Class III Backfill	1000	LF	$49.45	$49,450

Total Construction Cost	$64,285
Engineering	$11,571
Contingency	$11,413
Legal & Administration	$1,500
Total Project Cost	**$88,770**
Cost per Foot	**$89**

HDD

Item	Description	Unit	Quantity	Unit Price	Total
1	Ductile Iron Pipe Fittings	LBS	600	$5.00	$3,000
2	8" C900 PVC HDD Installed Pipe	LF	839	$115.00	$96,485
3	12" Cut-in sleeve	EA	1	$1,165.00	$1,165
4	12" Gate Valve	EA	1	$2,900.00	$2,900
5	Demolition & Site Preparation	LS	1	$2,500.00	$2,500
6	Hydro Seeding	LS	1	$600.00	$600
7	Site Restoration & Final Cleanup	LS	1	$900.00	$900
8	Construction Facilities & Temporary Controls	LS	1	$8,000.00	$8,000
	TOTAL BASIC BID				$115,550

HDD 8" Cost per Foot (100%)	**$138**
HDD 6" Cost per Foot (95%)	**$131**
HDD 4" Cost per Foot (90%)	**$124**
HDD 3" Cost per Foot (85%)	**$117**

SUMMARY

8" Gravity Sewer in Roadway	$188
8" Gravity Sewer Not in Roadway	$114
12" Gravity Sewer in Roadway	$211
12" Gravity Sewer Not in Roadway	$137
3" Force Main in Roadway	$109
3" Force Main Common w/ Gravity Sewer	$63
3" Force Main Not in Roadway	$51
4" Force Main in Roadway	$118
4" Force Main Common w/ Gravity Sewer	$72
4" Force Main Not in Roadway	$60
6" Force Main in Roadway	$127
6" Force Main Common w/ Gravity Sewer	$81
6" Force Main Not in Roadway	$69
8" Force Main in Roadway	$136
8" Force Main Common w/ Gravity Sewer	$90
8" Force Main Not in Roadway	$77
10" Force Main in Roadway	$155
10" Force Main Common w/ Gravity Sewer	$102
10" Force Main Not in Roadway	$89
HDD 8" Cost per Foot (100%)	$138
HDD 6" Cost per Foot (95%)	$131
HDD 4" Cost per Foot (90%)	$124
HDD 3" Cost per Foot (85%)	$117

Two Pump Station Alternatives (1&3)	Total Length	Road Bore	HDD Length	Surf. Inst. Length	Com. w/ Gr. Sew.	Asphalt Surf C&R	Near Future GPM	Far Future GPM	Near Future Dia. "	Far Future Dia. "	Near Future Cost	Far Future Cost	O&M Annual Costs	O&M PW
Gravity Sewer														
Grav. Sew. Tidewater - south from PS 1	1513	0	0	1513	0	0	91	91	8	8	$173,079	$173,079	$212	$3,010
Grav. Sew. River Side Resort - north from PS 1	594	0	0	594	0	130	119	629	8	12	$77,573	$90,792	$83	$1,182
Grav. Sew. Lunden Rd. Area to River Side Resort Grav. Sew.	214	0	0	214	0	75	8	8	8	8	$30,032	$30,032	$30	$426
Grav. Sew. thru Chetco Riv. Res.	764	0	0	764	0	540	99	636	8	12	$127,369	$144,372	$107	$1,520
Grav. Sew. Thompson Rd. to Chetco Riv. Res. Grav. Sew.	2606	60	0	2546	0	2546	10	20	8	8	$490,507	$490,507	$365	$5,185
Grav. Sew. Thompson Rd.Area Grav. Sew. 2	487	0	0	487	0	487	5	10	8	8	$91,758	$91,758	$68	$969
Grav. Sew. Thompson Rd.Area Grav. Sew. 3	971	0	0	971	0	971	5	15	8	8	$182,952	$182,952	$136	$1,932
Grav. Sew. Thompson Rd.Area Grav. Sew. 4	1478	0	0	1478	0	1478	4	20	8	8	$278,479	$278,479	$207	$2,941
Ferry Creek Heights Lower Grav. Sew.	2143	0	0	2143	0	2143	10	20	8	8	$403,775	$403,775	$300	$4,264
Ferry Creek Heights Upperr Grav. Sew.	1360	0	0	1360	0	1360	10	20	8	8	$256,245	$256,245	$190	$2,706
Apple Alley Grav. Sew.	770	0	0	770	0	770	10	10	8	8	$145,080	$145,080	$108	$1,532
Grav. Sew. along highway - Thompson Rd Area to PS 2 .	1023	60	0	963	0	80	4	4	8	8	$126,884	$126,884	$143	$2,036
Grav. Sew. along highway - Apple Alley Area to Grav. Sew.	332	0	0	332	0	40	10	10	8	8	$40,940	$40,940	$46	$661
Grav. Sew. Tribble Prop. - south from PS 2	1783	0	0	1783	0	0	18	18	8	8	$203,966	$203,966	$250	$3,548
Grav. Sew. Tribble Prop. - north from PS 2	1063	0	0	1063	0	0	18	570	8	12	$121,601	$145,258	$149	$2,115
Sub-Total	15588	120	0	15468	0	10620					$2,577,161	$2,631,040	$2,182	$31,016
Force Mains														
Alt 1A only FM PS 1 to Const. Way PS	*2430*	*0*	*583*	*1847*	*1513*	*0*	*210*	*N/A*	*4*	*N/A*	*$201,514*	*N/A*	$316	$4,490
Alt 1B & 3B FM PS 1 to Oak St. & Chetco Ave.	*4082*	*0*	*2120*	*1962*	*1513*	*100*	*210*	*762*	*4*	*8*	*$404,732*	*$468,275*	$531	$7,542
All Alt 1&3 FM PS 2 to Chetco Riv. Res. Grav. Sew.	1763	60	376	1327	963	120	70	600	3	6	$141,477	$169,868	$229	$3,257
										Alt A	$3,093,231	*N/A*	$2,939	$41,774
										Alt B	$3,296,449	$3,442,262	$3,154	$44,826

Four Pump Station Alternatives (2&4)	Total	Road	HDD	Surf. Inst.	Com. w/	Asphalt Surf	Near Future	Far Future	Near Future	Far Future	Near Future	Far Future	O&M Annual	O&M
Gravity Sewer	Length	Bore	Length	Length	Gr. Sew.	C&R	GPM	GPM	Dia. "	Dia. "	Cost	Cost	Costs	PW
Grav. Sew. Tidewater - south from PS 1	760	0	0	760	0	0	45.5	45.5	8	8	$86,940	$86,940	$106	$1,512
Grav. Sew. Tidewater - north from PS 1	750	0	0	750	0	0	45.5	45.5	8	8	$85,796	$85,796	$105	$1,492
Grav. Sew. River Side Resort - north from PS 2	580	0	0	580	0	130	29	29	8	8	$75,972	$75,972	$81	$1,154
Grav. Sew. Lunden Rd. Area to River Side Resort Grav. Sew.	214	0	0	214	0	75	8	8	8	8	$30,032	$30,032	$30	$426
Grav. Sew. thru Chetco Riv. Res.to PS 3	764	0	0	764	0	540	44	44	8	8	$127,369	$127,369	$107	$1,520
Grav. Sew. Thompson Rd. to Chetco Riv. Res. Grav. Sew.	2606	60	0	2546	0	2546	10	10	8	8	$490,507	$490,507	$365	$5,185
Grav. Sew. Thompson Rd.Area Grav. Sew. 2	487	0	0	487	0	487	5	10	8	8	$91,758	$91,758	$68	$969
Grav. Sew. Thompson Rd.Area Grav. Sew. 3	971	0	0	971	0	971	5	15	8	8	$182,952	$182,952	$136	$1,932
Grav. Sew. Thompson Rd.Area Grav. Sew. 4	1478	0	0	1478	0	1478	4	20	8	8	$278,479	$278,479	$207	$2,941
Ferry Creek Heights Lower Grav. Sew.	2143	0	0	2143	0	2143	10	20	8	8	$403,775	$403,775	$300	$4,264
Ferry Creek Heights Upperr Grav. Sew.	1360	0	0	1360	0	1360	10	20	8	8	$256,245	$256,245	$190	$2,706
Apple Alley Grav. Sew.	770	0	0	770	0	770	10	10	8	8	$145,080	$145,080	$108	$1,532
Grav. Sew. along highway - Thompson Rd Area to PS 4 .	1023	60	0	963	0	80	4	4	8	8	$126,884	$126,884	$143	$2,036
Grav. Sew. along highway - Apple Alley Area to Grav. Sew.	332	0	0	332	0	40	10	10	8	8	$40,940	$40,940	$46	$661
Grav. Sew. Tribble Prop. - south from PS 4	1783	0	0	1783	0	0	18	18	8	8	$203,966	$203,966	$250	$3,548
Grav. Sew. Tribble Prop. - north from PS 4	1063	0	0	1063	0	0	18	570	8	12	$121,601	$145,258	$149	$2,115
Sub-Total	17084	120	0	16964	0	10620					$2,748,295	$2,771,952	$2,392	$33,993
Force Mains														
Alt 2A only FM common to Oak St. & Chetco Ave. 4"	*2930*	*120*	*1400*	1410	*925*	*600*	*240*	*N/A*	*4*	*N/A*	*$325,880*	*N/A*	$381	$5,414
Alt 2A only FM common to Oak St. & Chetco Ave. 6"	*4043*	*120*	*1300*	2623	*850*	*740*	*480*	*N/A*	*6*	*N/A*	*$485,188*	*N/A*	$526	$7,470
Alt 2B only FM along NBCRR to Pine. & Myrtle St.4"	*2930*	*120*	*1400*	1410	*925*	*600*	*240*	*N/A*	*4*	*N/A*	*$325,880*	*N/A*	$381	$5,414
Alt 2B only FM along NBCRR to Pine. & Myrtle St.6"	*2520*	*0*	*1700*	820	*850*	*820*	*240*	*N/A*	*6*	*N/A*	*$287,378*	*N/A*		
Alt 4B only FM common to Oak St. & Chetco Ave. 8"	*2400*	*60*	*630*	1710	*925*	*785*	*N/A*	*840*	*N/A*	*8*	*N/A*	*$286,978*		
Alt 4B only FM common to Oak St. & Chetco Ave. 10"	*3340*	*60*	*1700*	1580	*0*	*1580*	*N/A*	*960*	*N/A*	*10*	*N/A*	*$528,015*		
All Alt 2&4 FM Tidewater PS 1 to Main FM - NBCRR	120	60	0	60	0	20	115	115	4	4	$15,557	$15,557	$16	$222
All Alt 2&4 FM FM Riverside RV PS 2 to Main FM - NBCRR	455	60	0	395	0	20	67	67	3	4	$32,188	$35,619	$59	$841
All Alt 2&4 FM FM Chetco Riv. Res. PS 3 to Main FM - NBCRR	404	60	0	344	0	20	67	67	3	4	$29,577	$32,565	$53	$746
All Alt 2&4 FM FM Tribble PS 4 to Main FM - NBCRR	65	60	0	5	0	5	67	600	3	6	$11,347	$11,434	$8	$120
										Alt A	$3,162,844	*N/A*	$2,908	$41,335
										Alt B	$3,322,152	$3,682,120	$3,053	$43,391

Lines

ALTERN.	INIT. COST	O&M ANNUAL	O&M PW	Total PW
1 A	$3,093,231	$2,939	$41,774	$3,135,004
1 B	$3,296,449	$3,154	$44,826	$3,341,275
2 A	$3,162,844	$2,908	$41,335	$3,204,179
2 B	$3,322,152	$3,053	$43,391	$3,365,543
3 A	NA	NA	NA	NA
3 B	$3,442,262	$3,154	$44,826	$3,487,088
4 A	NA	NA	NA	NA
4 B	$3,682,120	$3,053	$43,391	$3,725,511

PS

ALTERN.	INIT. COST	O&M ANNUAL	O&M PW	Total PW
1 A	$ 782,280	$ 15,891	$ 225,856	$ 1,008,136
1 B	$ 788,180	$ 16,271	$ 231,257	$ 1,019,437
2 A	$ 1,745,600	$ 39,168	$ 556,678	$ 2,302,278
2 B	$ 1,733,800	$ 38,351	$ 545,059	$ 2,278,859
3 A	NA	NA	NA	NA
3 B	$ 1,005,027	$ 24,176	$ 343,597	$ 1,348,624
4 A	NA	NA	NA	NA
4 B	$ 1,809,875	$ 39,862	$ 566,536	$ 2,376,411

Total

ALTERN.	INIT. COST	O&M ANNUAL	O&M PW	Total PW
1 A	$3,875,511	$18,831	$267,629	$4,143,140
1 B	$4,084,629	$19,425	$276,083	$4,360,712
2 A	$4,908,444	$42,077	$598,013	$5,506,457
2 B	$5,055,952	$41,404	$588,450	$5,644,402
3 A	NA	NA	NA	NA
3 B	$4,447,289	$27,330	$388,423	$4,835,712
4 A	NA	NA	NA	NA
4 B	$5,491,995	$42,915	$609,928	$6,101,922