

STATE OF IDAHO
DEPARTMENT OF WATER RESOURCES
BENEFICIAL USE FIELD REPORT

A. GENERAL INFORMATION

Permit No: 98-7825

Exam Date: 8/2/2012

1. Current Owner: CITY OF BONNERS FERRY
PO BOX 149
BONNERS FERRY ID 83805
(208)267-3105
2. Accompanied by: David Sims
Phone No: 208-267-3105
Address: 7232 Main Street, PO BOX 149, BONNERS FERRY ID 83805
Relationship to Permit Holder: ASSISTANT CITY ADMINISTRATOR

- | | |
|-------------------------|-------------------------|
| 3. <u>SOURCE</u> | <u>TRIBUTARY</u> |
| MYRTLE CREEK | KOOTENAI RIVER |

B. OVERLAP REVIEW

1. Other water rights with the same place of use: *98-2033*
2. Other water rights with the same point of diversion: *98-2033*

C. DIVERSION AND DELIVERY SYSTEM

1. **LOCATION OF POINT(S) OF DIVERSION:**

MYRTLE CREEK NW1/4SW1/4 Sec. 23, Twp 62N, Rge 01W, B.M. BOUNDARY County

Method of Determination: GPS

2.

Method of Determination:

3. ☒ Delivery System Diagram Attached (required). Indicate all major components and distances between components. Indicate weir size/pipe as applicable.
- ☒ Map Attached Showing Location(s) of point(s) of diversion and place(s) of use (required). Scale must be 1:24,000 or greater.
- ☒ Aerial Photo Attached (required for irrigation of 10+ acres).
- ☒ Photo of Diversion and System Attached

NE	NW	SW	SE
----	----	----	----

[illegible]

D. FLOW MEASUREMENTS : This is an email from the City of Bonners Ferry David Sims Assistant City Administrator. 208-267-3105

Hello Eric,

Here is the system information you requested for our Myrtle Creek transmission line, as provided by our engineer.

Please let us know if you need any additional information.

Thank you,

David

2159	ft	dam elevation
2014	ft	wtp elevation
16	in	pipe size
27097	ft	length
100		minor loss coefficient
h	145	ft
L	27097	ft
Q	2461.779	gpm
C	100	
d	16	inches

E. FLOW CALCULATIONS

Measured Method: **Manning's Equation**

___X___Additional Computation Sheets Attached

F. VOLUME CALCULATIONS

1. Volume Calculations for Irrigation:

$$V_{IR} = (\text{Acres Irrigated}) \times (\text{Irrigation Requirement}) =$$

$$V_{DR} = [\text{Diversion Rate (cfs)}] \times (\text{Days in Irrigation season}) \times 1.9835 =$$

$$V = \text{Smaller of } V_{IR} \text{ and } V_{DR} =$$

2. Volume Calculations for Other Uses:
- No Volume with this use.**

G. NARRATIVE/REMARKS/COMMENTS:

This system is called phase 2 water improvements for water rights 98-2033 and 98-7825. It is a gravity system that uses a 16 inch pipe with 145 feet of head that is 27097 feet in length with the discharge of 5.6 cfs. The build out of this system to comply with the reasonably anticipated future needs for the City of Bonners Ferry needs to be completed by the year 2021 for 8.8 cfs.

see Attached Exhibit A.

Have conditions of permit approval been met? ☒ Yes ☐ No

H. RECOMMENDATIONS**1. Recommended Amounts**

<u>BENEFICIAL USE</u>	<u>PERIOD OF USE</u>	<u>DIVERSION RATE</u>
MUNICIPAL	01/01 to 12/31	3.800 CFS
<u>Totals:</u>		3.800 CFS

2. Recommended Amendments

☐ Change P.D. as reflected above ☐ Add P.D. as reflected above ☒ None

☐ Change P.U. as reflected above ☐ Add P.U. as reflected above ☐ Other

I. AUTHENTICATION

Field Examiner's Name *Eric J. [Signature]* Date 12-28-2012

Reviewer *Beth E. [Signature]* Date 12/28/2012

EXHIBIT 'A' to:

Idaho Application for Permit Form 202

City of Bonners Ferry Municipal Water Rights

March 5, 2003

Scope: The following is the support document to Form 202(12/99), "State of Idaho, Department of Water Resources, APPLICATION FOR PERMIT to appropriate the public waters of the State of Idaho".

Pursuant to Idaho Code No. 42-202 at I.C. 42-202B.(5), "Reasonably anticipated future needs", the City hereby offers the following to support its Application to increase its current 5.0 cfs Water License No 16480 by 3.8cfs. City population growth will bring increased demand for public water supply. Census figures show:

1990 U.S. Census; Boundary, Bonner Co.(Idaho Distr. No. 1) 34,954

2000 U.S. Census; Boundary, Bonner Co.(Idaho Distr. No. 1) 46,706

This increase in census count "back-calculates" to a 2.9% average annualized growth rate. Twenty years future growth is the period being anticipated by this Application. By statistical calculation, the future requirement for water rate based on the above is:

$$Q(f)=Q(c) \times caf$$

$$\begin{aligned} &=Q(c) \times (1+i)^n \\ &=5\text{cfs} \times (1.029)^{20\text{yrs}} \\ &=8.8\text{cfs} \end{aligned}$$

Q(f)=future requirement

Q(c)=current water right

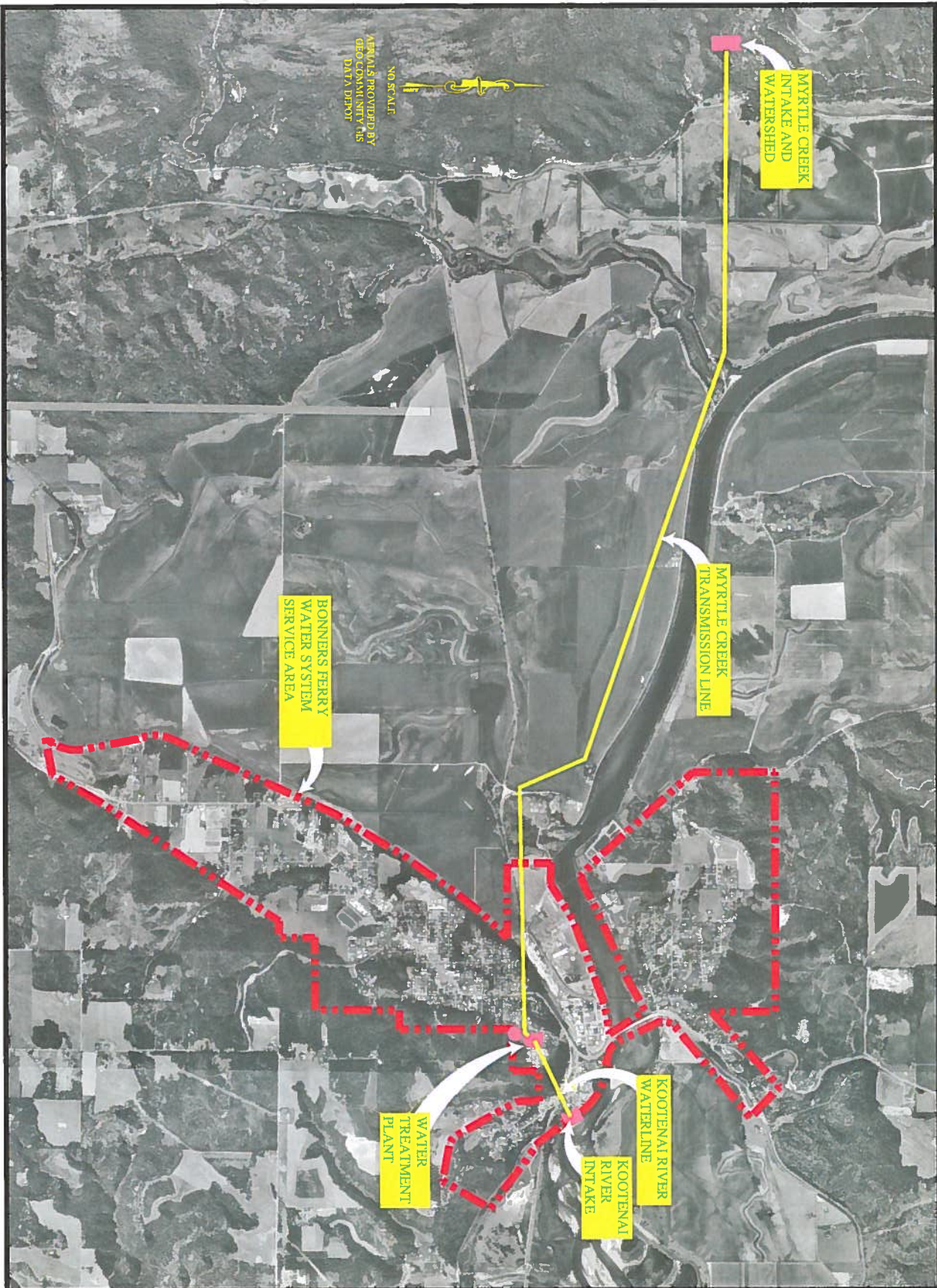
caf =statistical "compound amount factor"

i=percent rate of growth

n=number of years

Growth Request = Future - Present

=8.8cfs - 5.0cfs = 3.8cfs (Exh."A" revised 3/5/03)



PROJECT NO.: 15850
DESIGNED BY: NMM
DRAWN BY: SCS
CHECKED BY:
DWG NAME: 15850DS01.DWG
DATE: 10-26-07
SHEET NO.:

CITY OF BONNERS FERRY
PHASE 2
WATER SYSTEM IMPROVEMENTS

WATER SYSTEM OVERVIEW

WELCH-COMER
ENGINEERS | SURVEYORS
www.welchcomer.com 208-664-8382
350 E. Kathleen Ave. (toll free) 877-815-5672
Coeur d'Alene, ID 83815 (fax) 208-664-5943

NO.	DATE	REVISION DESCRIPTION	BY

Copyright 2007 by Welch-Comer Engineers, Inc. This document, and the information it contains, is the property of Welch-Comer Engineers, Inc. and is not to be reproduced, stored in a retrieval system, or transmitted in any form or by any means, without the written permission of Welch-Comer Engineers, Inc.

READ ME

Manning's Equation Calculator for Flow Rate in a Circular Conduit Flowing Full

S = 0.0054 ft/ft
 n = 0.013 manning's coefficient
 d = 16.0 pipe diameter (inches)
 D = 1.33 pipe diameter (feet)
 r = 0.67 pipe radius (feet)
 A = 1.40 area (ft²)
 WP = 4.19 wetted perimeter (ft)
 R = 0.33 hydraulic radius (ft)
 Q = 5.60 flow rate (CFS)

Channel Slope

Slope Options ☐ Manual Entry ☒ Slope Calculator

Slope Calculator

Rise = 145 feet
 Run = 27097 feet
 Slope, S = 0.0054 ft/ft

Pipe Material, (n): concrete, average

Pipe Diameter (inches) ## inches

Manning's Equation (1), is an empirical formula that solves for velocity (v) in a open channel under uniform flow. The continuity equation (2) when combined with equation (1) allows for the computation of the flow rate (Q) in an open channel under uniform flow.

In equations (1) and (3), n refers to Manning's Coefficient of Roughness and can be found in tabulated form for many open channel types. R is the hydraulic radius of the open channel and is equal to the area of the open channel divided by the wetted perimeter, R = A/P. S is the slope of the energy grade line which is often assumed to be equal to the slope of the channel.

Because Manning's Equation is empirical the units are not arbitrary. To obtain a velocity in ft/s and a flow rate in ft³/s, area must be reported in ft², hydraulic radius must be reported in ft, and S must be reported in ft/ft. Manning's Coefficient of Roughness is

$$(1) \ v = 1.49 \left(\frac{1}{n} \right) \left(R^{\frac{2}{3}} \right) \sqrt{S}$$

$$(2) \ Q = vA$$

$$(3) \ Q = 1.49 \left(\frac{1}{n} \right) (A) \left(R^{\frac{2}{3}} \right) \sqrt{S}$$



FLOW.JPG



POD1.JPG



SCREEN POD.JPG



PIPE.JPG



POD.JPG



POD2.JPG



POD 3.JPG



FLOW DOWN
STREAM.JPG







