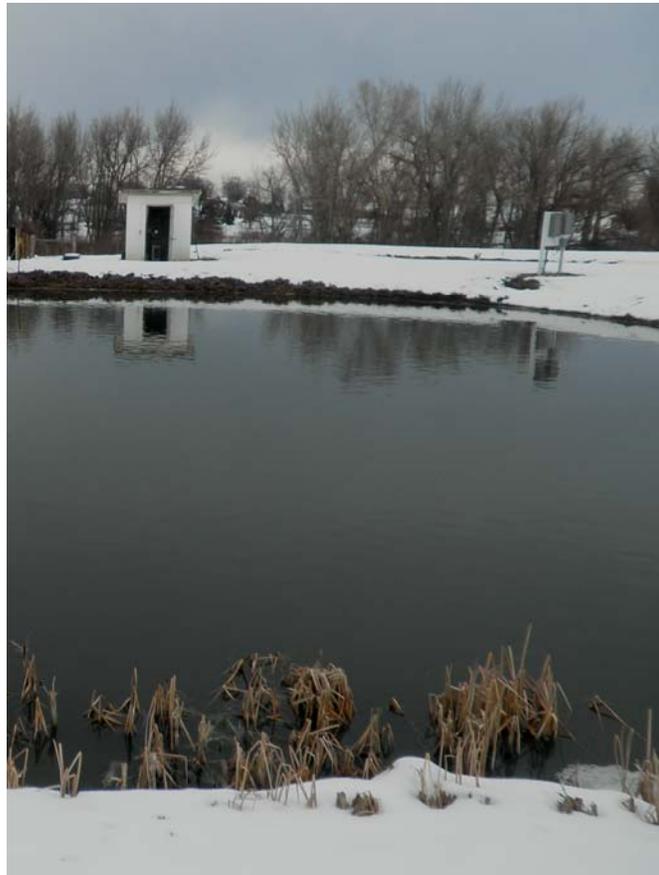


ENGINEERING REPORT
FOR THE
RIVER GLEN HOMEOWNERS ASSOCIATION



**SITE LOCATION APPLICATION AND
WASTEWATER UTILITY PLAN**

JUNE 2013

ENGINEERING REPORT
SITE LOCATION APPLICATION AND
WASTEWATER UTILITY PLAN

FOR

RIVER GLEN HOMEOWNERS ASSOCIATION

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JUNE 2013

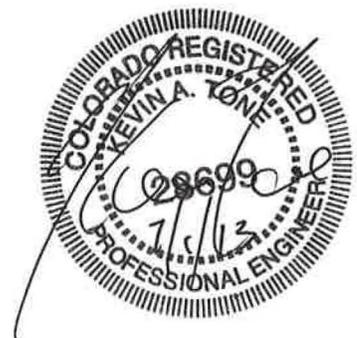




TABLE OF CONTENTS

SECTION 1 – EXECUTIVE SUMMARY	1
INTRODUCTION	1
BACKGROUND	1
PROJECT DESCRIPTION	2
SECTION 2 – PLANNING CONDITIONS	3
PLANNING AREA	3
SITE LOCATION	3
FLOODPLAIN	3
WETLANDS	6
208 PLAN COORDINATION	6
GROWTH AREAS AND POPULATION TRENDS	6
EXISTING WASTEWATER FLOW AND WASTEWATER FACILITIES	7
CURRENT FLOWS	7
PEAKING FACTORS	8
WASTEWATER TREATMENT FACILITY	8
COLLECTION SYSTEM	8
WASTEWATER FLOW FORECASTS	9
PROJECTED FLOW	9
LOADING	10
SECTION 3 – TREATMENT ENTITY AND SITE CONTROL	12
TREATMENT ENTITY	12
SITE CONTROL	12
SECTION 4 – EMERGENCY OPERATIONS AND MAINTENANCE	15
DESIGN CRITERIA REQUIREMENTS	15
LOCAL REQUIREMENTS	15
MAINTENANCE	15
BACK-UP SYSTEMS	16
TELEMETRY AND ALARMS	16
BACKUP POWER SUPPLY	16
EMERGENCY STORAGE/OVERFLOW PROTECTION SIZING AND OPERATOR RESPONSE TIME....	16
SECTION 5 – MANAGEMENT AND FINANCIAL CAPACITY	18
MANAGEMENT CAPACITY	18
FINANCIAL CAPACITY	18
PROJECT COSTS	18
CURRENT AND PROJECTED USER RATES	20
SECTION 6 – PROPOSED LIFT STATION AND IMPLEMENTATION SCHEDULE	21
PROJECT DESCRIPTION	21

LIST OF TABLES

TABLE 1: POPULATION AND WATER TAP CONNECTION (EQR) PROJECTIONS7
 TABLE 2: MONTHLY INFLUENT WASTEWATER FLOWS.....7
 TABLE 3: POPULATION AND FLOW PROJECTIONS..... 10
 TABLE 4: PROJECTED WASTEWATER CHARACTERISTICS AND LOADS AT 20-YEAR MAXIMUM MONTH FLOW PROJECTIONS (21,350 GPD) 11
 TABLE 5: OPERATOR CALL DOWN LIST..... 17
 TABLE 6: OPINION OF PROBABLE COST..... 19
 TABLE 7: CDPHE COMPLIANCE SCHEDULE AND IMPLEMENTATION PLAN 23

LIST OF FIGURES

FIGURE 1: SERVICE AREA4
 FIGURE 2: 208 PLANNING BOUNDARY5
 FIGURE 3: ONE MILE RADIUS MAP 13
 FIGURE 4: FIVE MILE RADIUS MAP 14
 FIGURE 5: PROPOSED LIFT STATION LOCATION AND FORCE MAIN ALIGNMENT..... 22

APPENDICES

- APPENDIX A – CDPHE SITE LOCATION APPLICATION FORM
- APPENDIX B – PRELIMINARY ENGINEERING REPORT
- APPENDIX C – TOWN OF BERTHOUD AGREEMENTS
- APPENDIX D – WASTEWATER TREATMENT ENTITY STATEMENT
- APPENDIX E – PROOF OF OWNERSHIP AND LEGAL DESCRIPTION
- APPENDIX F – FINANCIAL INFORMATION AND OPINION OF PROBABLE COST
- APPENDIX G – PUBLIC MEETING INFORMATION AND SITE LOCATION SIGN POSTING



SECTION 1 – EXECUTIVE SUMMARY

INTRODUCTION

The River Glen Homeowners Association (River Glen HOA or HOA) is proposing to modify the existing lift station associated with the River Glen HOA Wastewater Treatment Facility (River Glen HOA WWTF). The proposed modifications will transfer waste from the River Glen HOA service area to the Town of Berthoud Wastewater Treatment Facility (Berthoud WWTF) for treatment. This report has been prepared to provide information satisfying the requirements for the North Front Range Water Quality Planning Authority (NFRWQPA) Utility Plan and the Colorado Department of Public Health and Environment (CDPHE) Site Location Application for Interceptors Sewers Not Eligible for Certification and Lift Stations. Organization of this report is per the CDPHE's *Guidance Document for the Site Location and Design Approval Regulations for Domestic Wastewater Treatment Works 5 CCR 1002-2, Section 22.7*. The completed site location application form is provided in Appendix A.

BACKGROUND

River Glen HOA is a small subdivision located near the intersection of County Road 17 and County Road 4E in Larimer County. Currently, the subdivision is 98 percent developed, with one lot remaining. The River Glen HOA WWTF serves the River Glen Subdivision and the Riverside Farm Filing 1 Subdivision (Riverside Farm). Riverside Farm is 8 percent developed. The residential development of Riverside Farm is anticipated to continue during the 20-year planning period.

In 2012, the River Glen HOA and Riverside Farm HOA formed a local improvement district (LID) with Larimer County. The applicant for the site location application is the River Glen HOA (Larimer County LID 2012-1). The applicant's representative is Michael Dower, P.O. Box 1251, Berthoud Colorado.

The existing WWTF was constructed in 1974 and upgraded in 2005 to incorporate sanitary sewer flows from Riverside Farm. The CDPHE notified the River Glen HOA that the WWTF's renewed discharge permit (CO-0029742) would incorporate effluent ammonia and residual chlorine limits beginning January 1, 2017. The current treatment process is not capable of meeting the future discharge criteria. The inability of the River Glen HOA WWTF to meet these requirements prompted the development of a Preliminary Engineering Report (PER) to evaluate possible alternatives. The PER was submitted to the CDPHE on May 7, 2012 and is included for reference in Appendix B.

PROJECT DESCRIPTION

In order to comply with the CDPHE regulations and meet the effluent criteria of the 2017 discharge permit, the River Glen HOA has elected to decommission the WWTF and consolidate with the Berthoud WWTF. The River Glen HOA will modify the lift station associated with the River Glen HOA WWTF to transfer waste to the Berthoud WWTF. The Town of Berthoud, and the River Glen and Riverside Farm HOAs have developed Agreements (Agreement) to establish the terms of treatment and lift station operation services that will be provided by the Town (Appendix C). The LID will own the lift station through the life of the loan. After the loan repayment, ownership will be transferred to the Town of Berthoud. During the 20-year loan period, the Town of Berthoud will provide operation and maintenance services for the proposed lift station, force main, and gravity sanitary sewer main as described in the Agreements.

The recommended alignment for the connection to the Town's collection system is at the Dry Creek Interceptor Sewer, north of County Road 4E. To provide the most economical solution, the lift station modifications will be designed for buildout conditions and will require upgraded lift station equipment and automated flow measurement, approximately 5,150 linear feet of 4-inch high density polyethylene (HDPE) force main, approximately 1,000 linear feet of 8-inch polyvinyl chloride (PVC) gravity sanitary sewer main, site upgrade to three-phase power, and a proposed dual pump system with a pumping capacity of 80 gpm.

This alternative has the lowest life cycle cost and reduces the maintenance requirements for the River Glen HOA considerably. The complete alternative analysis is provided in the PER, Appendix B. The opinion of probable cost for the modified lift station, force main, and gravity sanitary sewer main, is \$1,160,500 including engineering, construction, contingency, and overhead and profit. As required by the conditions of the State Revolving Fund Loan, the construction project will be managed by Larimer County.

SECTION 2 – PLANNING CONDITIONS

PLANNING AREA

The service area for the WWTF includes 65 lots in the River Glen Subdivision and 45 lots in the Riverside Farm. The 65 lots in the River Glen Subdivision have been platted and 21 of the 45 lots in Riverside Farm have been platted (Filing 1). The total number of platted lots in the service area is 86, with 68 active connections. The service area map is provided in Figure 1 and encompasses approximately 279 acres. There is no option for the service area to grow beyond the existing boundaries. The maximum number of sanitary sewer connections, including unplatted lots, is 110.

The NFRWQPA has not established a 208 planning boundary for the River Glen HOA. However, the River Glen HOA is included in the Town of Berthoud current 208 planning boundary. The current 208 planning boundaries for the area are provided in Figure 2.

SITE LOCATION

The proposed lift station is located at the northwest corner of County Road 17 and Wagonwheel Court in Berthoud, Colorado. The legal description for the facility is the SE ¼, of Section 27, Township 4N, Range 69W. The lift station is located on the existing WWTF site, which was approved under site location application number 1810. The latitude and longitude of the facility is 40°16'41.22" north and 105°5'33.66" west.

The lift station will transfer waste to the Berthoud WWTF located at 20210 County Line Road. The geographic location of the Berthoud WWTF is 40°17'00" north, 105°04'00" west.

FLOODPLAIN

The existing River Glen HOA WWTF is located approximately 250 feet south of the Little Thompson River. The 100-year floodplain map was recently modified and is in the final stages of the Federal Emergency Management Agency's (FEMA) approval process. Changes to the 100-year flood map show the entire WWTF property within the floodplain boundaries. The proposed Flood Insurance Rate Map (FIRM) is provided in the PER.

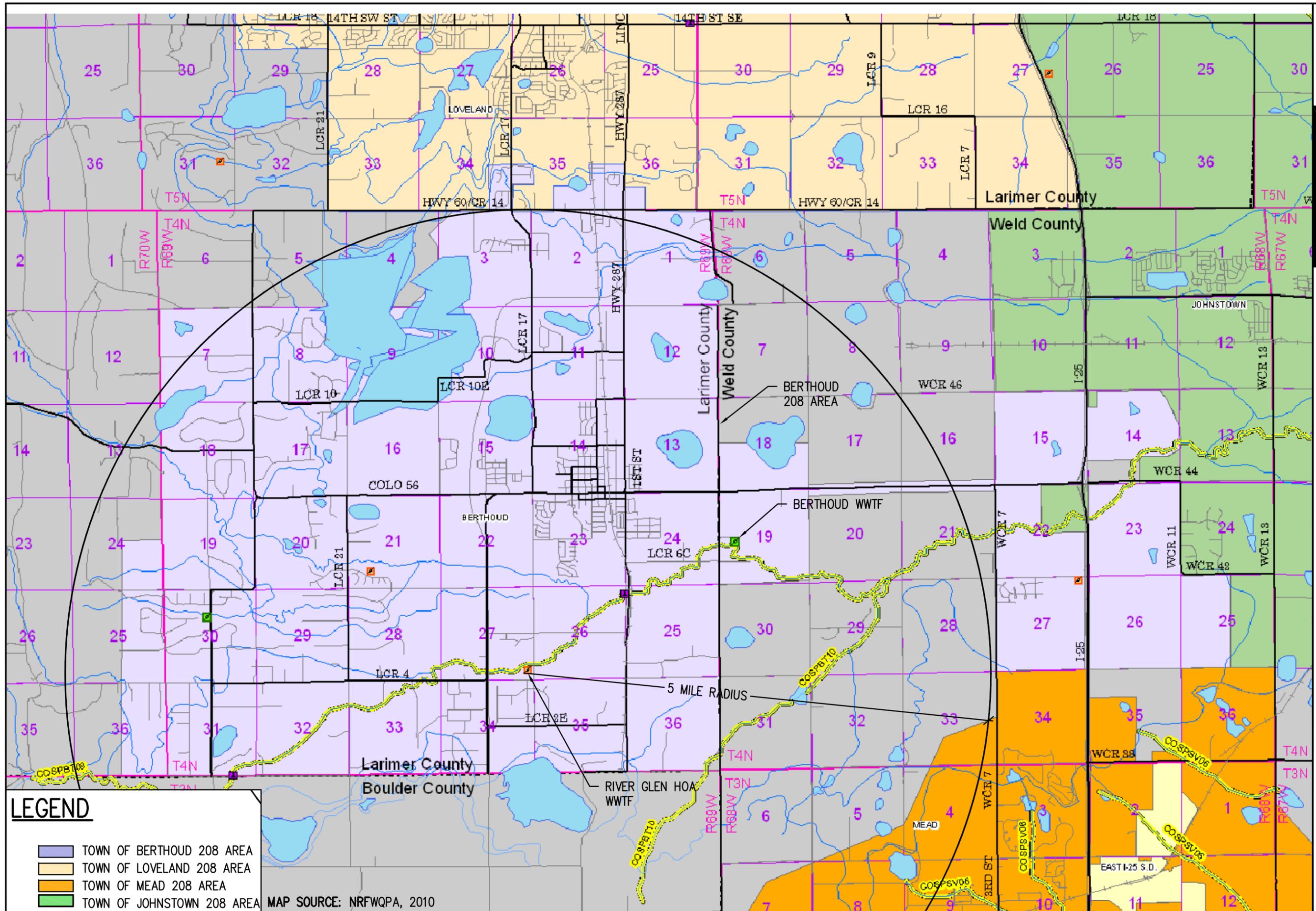
In order to create the new flood maps for the Little Thompson River, FEMA conducted a study to re-evaluate the 1974 floodplain evaluation. The 2011 floodplain evaluation used the NGVD29 vertical datum for the evaluation and shows the 100-year flood elevation as 4,984 feet above mean sea level at the existing WWTF property. The 2011 Flood Insurance Study published by FEMA based on these results, as well as the corresponding FIRMs, use the NAVD88 vertical control datum and shows the 100-year flood elevation at the existing facility as 4,988 feet above mean sea level.



FIGURE 1 - SERVICE AREA
 RIVER GLEN HOA
 JUNE 2013



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FIGURE 2 - AREA 208 BOUNDARIES
 RIVER GLEN HOA
 JUNE 2013

The existing facility plans denote the top of berm elevation for the aeration lagoons as 4,990 feet; however, the datum used for the development of these plans is not noted. Prior to the design of the lift station on the existing property, survey information will be required to determine the actual elevation on-site. In the event that the top of berm elevation is accurate in the NGVD 29 or NAVD88 vertical datum at 4,990 feet, the River Glen HOA can submit a letter of map amendment to FEMA. The letter of map amendment will effectively remove the lift station from the 100-year floodplain under these circumstances. If the property is found to be at an elevation under the 100-year flood elevation as noted by the FEMA studies, this will be taken into account during the design phase.

The estimated capital cost for this project provides a conservative estimate that incorporates potential flood proofing expenses. Additionally, a 20 percent contingency was applied to the capital cost, which is anticipated to be sufficient for additional flood proofing requirements.

WETLANDS

According to the National Wetlands Inventory, the WWTF site is not located in a delineated wetland area. It is near a riverine system, which is characterized by low gradient and slow velocity water. The locations of the wetlands with respect to the existing WWTF site are shown in Figure 2 of the PER, Appendix B.

208 PLAN COORDINATION

The NFRWQPA is the 208 Water Quality Planning Agency for Larimer and Weld County. The River Glen HOA and Town of Berthoud service area are both within the Berthoud 208 Boundary. This report will be submitted to the NFRWQPA as the proposed Wastewater Utility Plan for review and approval.

GROWTH AREAS AND POPULATION TRENDS

The current population of the River Glen Subdivision is 150 residents and the population of Riverside Farm is 12 residents; therefore, the total service area population is 162 residents. There are 68 equivalent resident units (EQRs) within the service area boundaries, 64 connections in the River Glen Subdivision and 4 connections in Riverside Farm. This indicates an average household population density of 2.38 people per household. According to the 2010 U.S. Census the average household size in the Town of Berthoud, 2.52 people per household. For conservative planning purposes, a household population density of 2.5 people per household is used for population projections through buildout.

The 2010 U.S. Census data lists the Berthoud population as 5,105 residents. According to the 2000 U.S. Census, Berthoud's population was 4,839 residents. This comparison demonstrates an annual growth rate of 0.55 percent between 2000 and 2010. The Larimer County annual growth rate is 1.9 percent per year. The difference may be influenced by various economic, social, and geographical characteristics. Unless there is some unforeseen demographic shift, it is not likely that the River Glen HOA service area will exceed Berthoud's 0.55 percent annual growth rate.

The maximum number of sanitary sewer connections at buildout in the River Glen HOA service area is 110. Using a population density of 2.5, the buildout population is 274 residents. At the annual growth rate, 0.55 percent, the 20-year population is 190 people and 76 EQRs. A summary of the population projections are shown in Table 1. Expanded projections through buildout are available in the PER, Appendix B.

Table 1: Population and Water Tap Connection (EQR) Projections

Year	EQRs	Population
2015	69	172
2020	71	177
2025	73	182
2030	75	187
2033	76	190
Buildout	110	274

EXISTING WASTEWATER FLOW AND WASTEWATER FACILITIES

CURRENT FLOWS

The influent flow to the River Glen HOA WWTF is metered and reported monthly to the CDPHE using Discharge Monitoring Reports (DMR), this information was used to determine existing influent flow conditions to the WWTF. The monthly average flow is 0.017 MGD with a peak day flow of 0.024 MGD. The monthly-metered influent data is shown Table 2. A few of the DMRs did not provide recorded data; in these instances, results from previous years were used. The annual average flow was determined to be 16,420 gallons per day (gpd). The average per capita wastewater flow is approximately 100 gpd. The per capita flow rates are calculated based on the current population, 162 residents. Influent flow data from 2008 through 2010 is provided in detail in the PER, Appendix B.

Table 2: Monthly Influent Wastewater Flows

Month	Average Daily Flow (gpd)	Peak Day Flow (gpd)	Daily Per Capita Flow (gpcd)
January, 2009	13,000	26,000	80
February, 2009	13,000	13,000	80
March	17,000	18,000	105
April	23,000	28,000	142
May	14,000	28,000	86
June, 2009	16,600	17,600	103
July, 2009	28,000	31,000	173
August	15,000	28,000	93
September	14,000	20,000	86
October	13,000	31,000	80
November	19,000	25,000	117
December, 2008	11,400	14,700	70
Average	16,420	23,358	100

PEAKING FACTORS

The maximum month peaking factor was calculated using the maximum monthly flow (28,000 gpd, July) and dividing that figure by the average daily flow. Using this method, the maximum month peaking factor is 1.7. The maximum month flow calculated from existing data is higher than anticipated. Typical values for maximum month peaking factors are 1.25. Noting that inconsistencies have been reported regarding the influent flow monitor, the 1.25 peaking factor will be used for design purposes. Based on this factor, the maximum month flow is 20,522 gpd. The historical data from the facility demonstrates a peak day flow of 23,358 gpd. Based on the peak day flow, the peak day factor is 1.5. The WWTF does not record the instantaneous peak flow (peak hour); therefore, there is no historical data available to calculate a peak hour factor. Based on Metcalf & Eddy's *Wastewater Treatment*, for small towns with a similar population to the River Glen HOA's service area, the influent hourly peaking factor for the WWTF is estimated as 4.0. Using this peaking factor, the estimated existing peak hour flow is 65,667 gpd.

WASTEWATER TREATMENT FACILITY

The existing WWTF was constructed in 1974 and was upgraded in 2005 to incorporate the lift station for the Riverside Farm Subdivision. No upgrades have occurred that would alter the hydraulic or organic capacity of the facility. The WWTF is permitted under CDPHE permit number CO-0029742 and is located on a privately owned 8.19 acre site.

The existing WWTF consists of two lift stations that pump wastewater into one of two aeration lagoons. The aeration cells are above ground lagoons with a combined capacity of 556,000 gallons. The basins are mechanically aerated using two surface aerators. Wastewater flows from the lagoons to a rock filter polishing pond. The effluent is disinfected with sodium hypochlorite and is dechlorinated via a tablet dechlorination system. Treated effluent is surface discharged to the Little Thompson River. The existing WWTF layout is shown in Figure 3.

The current hydraulic loading is 16,417 gpd and the organic loading is estimated at 34.2 lbs BOD/day. The design hydraulic capacity of the facility is 0.029 MGD (29,000 gpd) and the organic capacity of the existing WWTF is 52 lbs BOD/day. The discharge permit issued September, 2011 stated that the WWTF will need to reach monthly effluent ammonia limits between 1.7 mg/L and 5.1 mg/L beginning in 2017. The current treatment system has dechlorination capacity; however, the existing effluent ammonia concentration averages 19.2 mg/L.

In order to meet the 2017 effluent limits, the River Glen HOA is proposing to consolidate with the Berthoud WWTF.

COLLECTION SYSTEM

The influent wastewater flow characteristics demonstrate an increase in summer months as compared to winter flow rates, from approximately 80 gpcd in January to a high of 173 gpcd in July. The collection system is approximately 50 percent vitrified clay pipe and 50 percent PVC pipe, and is over 35 years old; in an evaluation of the collection system video recordings, dated

December 28, 2011, the system was discovered to be generally in "good condition with a few locations showing infiltration".

The findings of the evaluation included areas of root infiltration at service connections, groundwater infiltration, pipe offsets, and multiple fractures. The significant areas recommended for improvement included:

- Repair due to pipe offset – recommended excavation and raising of the offset pipe segment
- Jetting of the collection system to address root intrusion
- 523 feet of the collection system should be repaired to address infiltration issues – recommended replacement or cured in place pipe (CIPP) lining
- 15 feet of the collection system should be repaired to address fractures – recommended excavation of CIPP lining
- 315 linear feet of service connections should be repaired – recommended excavation to replace the service connection

During this evaluation, priorities were also developed for the HOA to create a capital improvements plan. 307 linear feet of the 523 linear feet were highly recommended to be repaired to address the most significant infiltration issues.

The HOA has conducted the repair recommended to address the pipe offset. Additionally, 731 linear feet of sanitary sewer main was lined using a CIPP process in February of this year (2013). The estimated cost from the contractor is \$23,800. The HOA is intending to allocate \$23,000 annually in the collection system O&M budget to continue the recommended collection system improvements for several years.

The impact of these improvements on the per capita flow rate is currently unknown. However, it is estimated that reduction of 10 gpcd will occur because of these efforts. The wastewater flow projections in the following section are premised upon this reduction.

WASTEWATER FLOW FORECASTS

PROJECTED FLOW

Buildout population is 274 people based on 110 connections and 2.5 people per household. The 20-year projected population is 190 residents and 76 EQRs, based on a 0.55 percent annual growth rate and a population density of 2.5 people per household. Collection system improvements are currently underway to address the system's I/I flows. As a result of these repairs, the average per capita flow is anticipated to decrease by approximately 10 gpcd. To account for the reduction in I/I, the estimated per capita flow used for future flow projections is 90 gpcd.

The projected average daily flow for the 20-year planning period is 17,170 gallons per day. The projected average daily flow at buildout is 24,750 gpd. The maximum monthly flow projection for the 20-year planning period is 21,460 gpd. The maximum monthly flow projections at buildout is 30,940 gpd. The projected 20-year peak daily flow and peak hour flow are 25,760

gpd and 68,680 gpd, respectively. The projected buildout peak hour flow is 99,000 gpd. The population and flow projections are summarized in Table 3. This information is provided in detail in the PER, Appendix B.

Table 3: Population and Flow Projections

Year	Population	Average Daily Flow (gpd)	Max Month Flow (gpd)	Peak Day Flow (gpd)	Peak Hour Flow (gpd)	Average Organic Load (lbs BOD/day)
2015	172	15,470	19,340	23,210	61,880	32.3
2020	177	15,900	19,880	23,850	63,600	33.1
2025	182	16,350	20,430	24,520	65,370	34.1
2030	187	16,800	21,000	25,200	67,190	35.0
2033	190	17,100	21,350	25,620	68,300	35.6
Buildout	274	24,660	30,830	36,990	115,200*	51.4

*Buildout Peak Hour flow rate calculated by looking at maximum pumping capacity for 80 gpm lift station pump

LOADING

The wastewater influent consists entirely of municipal wastewater flows. There are no commercial connections within the service area. Influent wastewater characteristics for the WWTF are typical for domestic wastewater.

Influent wastewater records from 2008 through 2010 were used to establish average influent loading characteristics for the WWTF. Historical water quality data is included in the PER, Appendix B. From this data, the average influent BOD concentration at the WWTF is 207 mg/L. The maximum and minimum BOD concentrations are 471 mg/L and 92 mg/L respectively. Metcalf & Eddy's *Wastewater Treatment* gives a typical BOD concentration of 250 to 350 mg/L for domestic wastewater. Based on these guidelines, the historical average influent BOD concentration to the WWTF is low for domestic wastewater. As a conservative measure, the WWTF's influent BOD concentration is assumed to be 250 mg/L. As a result, the existing organic loading rate is estimated at 34.2 lbs BOD/day or 0.21 lbs BOD/capita/day at 16,417 gpd.

The average influent TSS concentration at the WWTF is 253 mg/L. The maximum and minimum BOD concentrations are 773 mg/L and 99 mg/L, respectively. The existing average TSS concentration of 253 mg/L is used to project future loading.

The existing WWTF does not monitor influent ammonia concentration. Effluent ammonia (NH₃-N) concentrations are monitored at the facility and average 19.2 mg/L. Metcalf & Eddy's *Wastewater Treatment* gives typical influent total nitrogen as free ammonia concentration of 30 to 45 mg/L for domestic municipal wastewater. For the purpose of this report, free ammonia concentration of 30 mg/L will be used to project future loading. Phosphorus is not currently monitored at the WWTF. A typical approximation for influent phosphorus concentrations, 7 mg/L, is used for future projections.

The projected influent concentrations of BOD, TSS, NH₃-N, and phosphorus are summarized in Table 4.

Table 4: Projected Wastewater Characteristics and Loads at 20-year Maximum Month Flow Projections (21,350 gpd)

Constituent	Estimated Concentration (mg/L)	Estimated Production (lbs/day)	Estimated Production (lbs/capita/day)
BOD ¹	250	51.4	0.19
TSS	253	52.0	0.19
NH ₃ -N ¹	30	6.2	0.022
Total P ¹	7	1.4	0.005

¹Assumed values taken from Metcalf & Eddy, Table 3-15 Typical composition of untreated domestic wastewater

SECTION 3 – TREATMENT ENTITY AND SITE CONTROL

TREATMENT ENTITY

The service area boundary is 0.5 miles outside the Town of Berthoud's growth boundary. There are no municipal or industrial dischargers within a one mile radius of the River Glen HOA (shown in Figure 3). The Berthoud WWTF is within 2.5 miles from the proposed lift station, as shown in the five mile radius map (Figure 4). The River Glen HOA has coordinated consolidation with the Berthoud WWTF.

The required letter from the Berthoud WWTF, wastewater treatment entity, is provided in Appendix D.

SITE CONTROL

The River Glen HOA owns the property where the existing WWTF is located. The lift station is located on the same property. The force main and gravity sanitary sewer main from the proposed lift station to the Dry Creek Interceptor connection will be constructed within County Road 17, within the Larimer County and Town of Berthoud right-of-way (ROW). According to Larimer County mapping data, County Road 17 is owned by Larimer County from the lift station property to the intersection with County Road 4E. North from County Road 4E, the road is owned by the Town of Berthoud. Larimer County data documenting road ownership is provided in Appendix E. The construction within these right-of-ways has been authorized by the appropriate agencies.

The proof of legal ownership for the property where the existing WWTF and proposed lift station is located is provided in Appendix E.

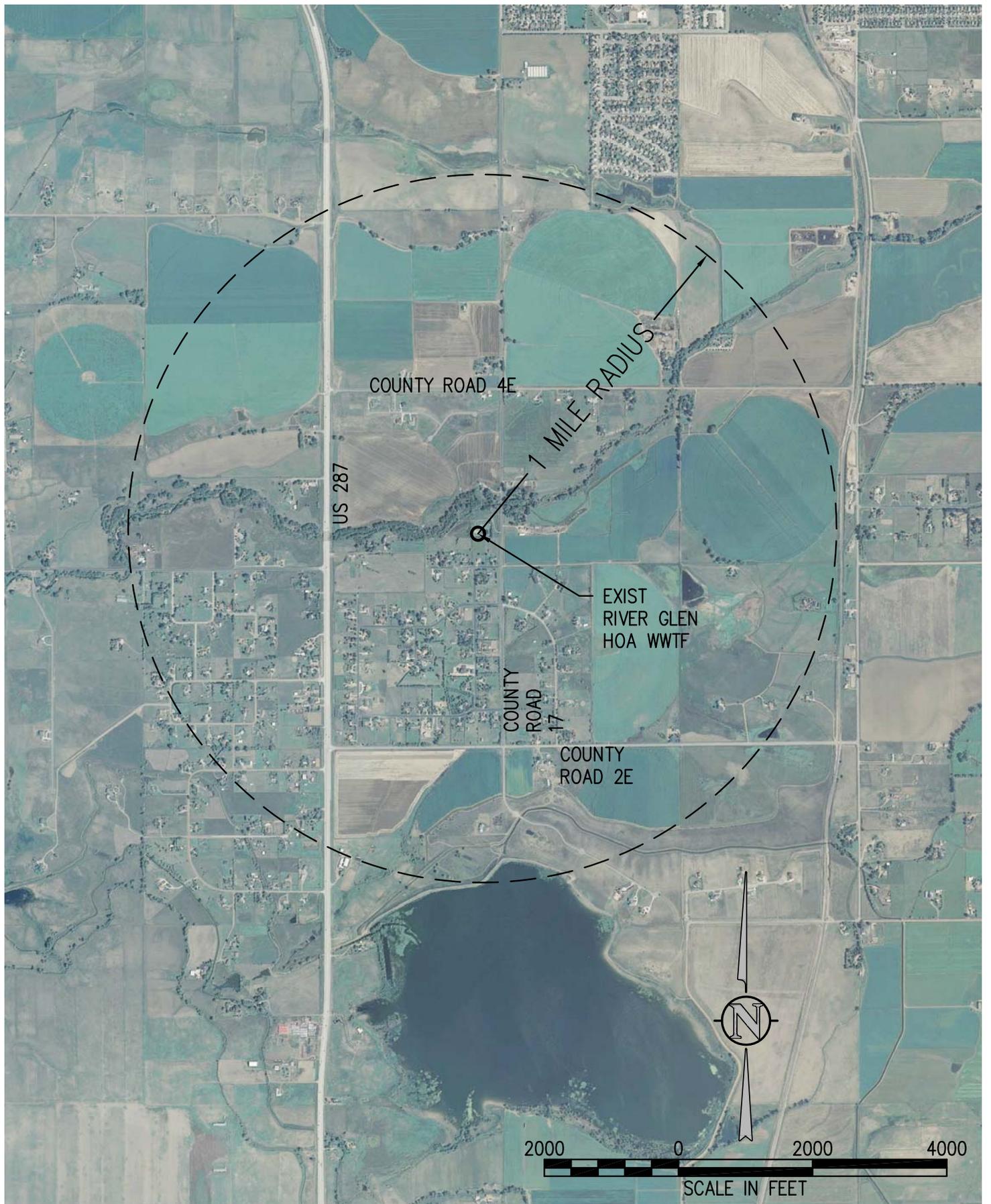


FIGURE 3 - 1 MILE RADIUS
 RIVER GLEN HOA
 JUNE 2013



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FIGURE 4 - 5 MILE RADIUS
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SECTION 4 – EMERGENCY OPERATIONS AND MAINTENANCE

DESIGN CRITERIA REQUIREMENTS

Emergency operations and maintenance procedures required by the *Colorado Design Criteria for Domestic Wastewater Treatment Works, WPC-DR-1* for lift stations include the following:

- Protection from physical damage resulting from 100-year flood conditions and the capability to operate during 100-year flood conditions
- Locked structures and/or security fencing as required to restrict unauthorized access
- Self activated alarm system to monitor power failure, high wet well water level, or other pump station malfunction
- Alarm transmittal to a continuously monitored location or operator (auto-dialer to on-call operator) and an audio or visual device installed at the station
- Power provided from two independent sources unless adequate overflow storage is provided and the local operating agency can provide portable backup power generation equip and/or temporary pumping capability
- Overflow storage volume sufficient to contain all wastewater during the period of time required to restore pump station operation, install temporary pumping equipment or haul wastewater to an acceptable point of discharge.

LOCAL REQUIREMENTS

Flood-proofing requirements will be addressed by extending the top of wet well elevation 18 inches above the flood elevation as required and a flood proofing plan (if necessary) will be developed during the design phase. Additional costs have been included in the opinion of probable cost in the event that flood proofing is required.

The River Glen HOA lift station site is not designated as a sensitive site location. There are no known special practices and/or local requirements associated with the construction of the lift station on the existing site. An environmental assessment was conducted as part of the application for the State Revolving Fund loan. The environmental assessment has been reviewed and the additional requested information is being submitted for the issuance of a Finding of No Significant Impact (FONSI).

MAINTENANCE

The proposed lift station, force main and gravity sanitary sewer main will be maintained by the Town of Berthoud as defined in the Agreements provided in Appendix C. All maintenance

standards for lift stations in the Town of Berthoud service area will apply for the proposed facility. A full maintenance check is completed monthly on all lift stations in the service area to ensure continued proper operation. The monthly service includes checking oil level, battery operation, fuel level, coolant level, and a power transfer simulation. Pump run hours are calculated and recorded during the monthly check to ensure that the pumps are alternating properly.

BACK-UP SYSTEMS

TELEMETRY AND ALARMS

A state of the art autodialer system will be included in the design for the lift station. The system will communicate with the Berthoud WWTF SCADA system. Per the Town of Berthoud operating procedures, the lift station will be called once per week to verify that the dialer is working properly and that there are no active alarms.

BACKUP POWER SUPPLY

A standby diesel generator will be provided for the modified lift station. The generator will provide back-up power to the lift station pumps, controls, and automated flow meter in the event of power loss.

EMERGENCY STORAGE/OVERFLOW PROTECTION SIZING AND OPERATOR RESPONSE TIME

Emergency overflow storage will be provided at the existing WWTF site and will be sized to provide sufficient volume for emergency response to restore power or replace equipment in the event of an emergency. The Berthoud WWTF operator response for all lift stations in the service area is 30 minutes. To provide a sufficient safety factor, three hours of emergency overflow storage will be provided. At average buildout flow conditions (24,660 gpd), this equates to 3,100 gallons of overflow storage. The final design of emergency overflow storage will be developed during the design phase. Additional flood proofing precautions will be required for all emergency overflow storage facilities and will be taken into account during the design phase.

The provided autodialer will have the appropriate features where several call out numbers can be entered. The autodialer call list will begin with the on-call operator number. A minimum of four alarms will be reported on the autodialer call, including power, high level alarm, pump failure, and low battery. In any emergency event, the operator on call will be the first contact. The on-call operator has a response time of approximately 30 minutes. If the on-call operator arrives to a situation outside of the realm of their capabilities, they should call the follow the Wastewater Treatment and Collections call down list for the Town of Berthoud. The call down list is provided in Table 5.

Table 5: Operator Call Down List

Contact	Contact Information
Town Hall	(970) 532-2643
Berthoud Police Department	(970) 532-2611
Main Plant	(970) 532-2412
On-call duty phone	(970) 556-6209
Superintendent – Robert Airhart	(970) 556-0368

SECTION 5 – MANAGEMENT AND FINANCIAL CAPACITY

MANAGEMENT CAPACITY

The Agreement between the LID and the Town of Berthoud has been developed giving the Town of Berthoud operation and maintenance responsibilities for the lift station, force main, and gravity sanitary sewer main. The O&M provided by the Town includes all maintenance as discussed in Section 4, replacement costs, and electricity costs associated with the operation of the lift station. The LID will own the force main and lift station during the loan repayment period, at which point ownership will be transferred to the Town. The operations will be contracted to the Town of Berthoud during the repayment period. The Town will charge \$4.00 per month per connection to provide this service.

In addition to the services provided by the Town of Berthoud under the agreement mentioned above, the River Glen and Riverside Farm HOAs will be responsible for miscellaneous costs associated with the lift station. These costs include liability insurance, pollution insurance, mowing, office/postage, water, and miscellaneous expenses.

The River Glen and Riverside Farm HOA will establish a joint fund to cover the costs associated with the lift station. The River Glen HOA will continue to operate and maintain their collection system independently. Operations and maintenance responsibility of the collection system will not be impacted by the proposed project. The existing Riverside Farm lift station and collection system will continue to be operated and maintained by the Riverside Farm HOA and the Colorado Community Bank. Operations and maintenance responsibility of this lift station will not be impacted by the proposed project.

FINANCIAL CAPACITY

PROJECT COSTS

The capital cost estimate for the proposed lift station is provided in Table 6. Project cost estimated were developed during the PER process and are provided in detail in that report (Appendix B). The proposed lift station opinion of probable cost includes Berthoud's initial tap fee \$6,285 per connection as a capital cost. The 86 total platted lots will be considered connections per the agreement with Berthoud WWTF regardless of their occupancy status and will be charged the initial tap fee. Future platted lots will be required to pay the Berthoud tap fee at the current rate of connection.

Monthly service fees for the treatment at the Berthoud WWTF and O&M of the proposed facilities will only be paid by active service connections. These fees include a monthly \$27.06 charge per connection, an additional \$6.53 per month per 1,000 gallons (4,000 gallons per active connection was used to calculate the projected O&M costs), and \$4.00 per month per connection for the O&M of the proposed facilities. Based on current information provided by the River Glen HOA, it was assumed that all 86 platted lots will be in service by 2017. This assumption was used to project annual O&M costs and customer rates, discussed in the following section.

The detailed capital cost breakdown is provided in Appendix F. A summary of the capital costs are provided in Table 6.

Table 6: Opinion of Probable Cost

Description	Installed Cost
Division 02 – General Sitework	\$215,700
Division 03 – Concrete	\$32,000
Division 11 – Equipment	\$80,000
Division 16 – Electrical and Controls	\$43,000
Miscellaneous – Bore	\$20,000
Subtotal	\$390,700
Contingency (20%)	\$78,100
Contractors OH&P (15%)	\$70,300
Permitting, Design and Construction Administration (15%)	\$80,900
Construction Capital Total	\$620,000
Berthoud WWTF Tap Fee	\$540,500
PROJECT TOTAL	\$1,160,500

The River Glen HOA and Riverside Farm Filing 1 HOA formed an LID with Larimer County (Larimer County LID 2012-1) in order to fund the project with a State Revolving Fund (SRF) Loan. The PER was submitted to the CDPHE on May 7, 2012. Capital for the project will be obtained from the loan funds. The SRF loan application was submitted to the CDPHE on December 15, 2012. The LID does not have existing debt and has the ability to borrow funds for this purpose. The SRF loan debt will be paid as an annual tax to Larimer County by each platted lot owner. The annual repayment per lot for the debt service is \$873.07 per lot, plus an \$8.82 fee paid to Larimer County. The total annual payment to Larimer County will be \$881.89 per platted lot. A letter discussing the repayment arrangement with Larimer County is provided in Appendix C. The loan repayment rate was calculated using an interest rate of 2.0 percent over the 20 year loan repayment period. A 20-year cash flow projection that includes the expenses associated with the lift station and the debt repayment is provided in Appendix F. The ratio of the operating revenue to the operating expense is 1.05 and the ratio of total revenue to operating expense and debt service combined (coverage ratio) is 1.03.

The 5-year budget for the lift station operating expenses associated with the lift station are provided in Appendix F. From the 5-year budget, it is evident that reserve accounts are available. Based on the agreement with the Town, emergency expenses and replacement funds will be provided by the Town and were not incorporated in the HOAs independent budget.

Discussions regarding general income and expense items for the River Glen HOA annual budget begin amongst the Board of Directors in September. In October, the various committees (sanitation, new sanitation, irrigation) prepare their budgets for the upcoming year. The Board of Directors combines the general income/expenses with the committee budgets in October and approves the budget to be submitted to the homeowners at the annual meeting, held in November. One week prior to the annual meeting, the proposed budget and reports from each committee are mailed to all homeowners. During the annual meeting, the budget items are discussed on a line-by-line basis by each committee chair and a member of the Board. Any changes are made at that time and a vote is taken to approve the budget at the end of the meeting.

The capital improvements projects for the HOA's collection system were discussed in Section 2 of this report. The River Glen HOA will continue to repair the collection system using HOA funds that are independent from the lift station

CURRENT AND PROJECTED USER RATES

In 2012, the River Glen HOA users paid \$200 per quarter for WWTF expenses, or a monthly fee of \$66.67 per connection. The active lots in the Riverside Farm development paid \$150 per quarter, or \$50.00 per month. Undeveloped, platted lots in the Riverside Farm development paid \$54 per quarter, or \$18.00 per month. These rates are higher than the state average of \$16.42 per month. The River Glen HOA does not have any outstanding debt related to its wastewater system. The current operation and maintenance cost for the collection system and the WWTF is approximately \$30,000 per year, including the contract operator's salary and one-time expense items. See Appendix F for expense and revenue reports from 2009 through 2011.

The customer fees associated with the operation of the lift station are provided in Appendix F. Customer rates for the lift station include the monthly fees paid to the Town of Berthoud and the miscellaneous fees paid to the joint River Glen and Riverside Farm HOA committee for the miscellaneous fees associated with the lift station operation. The monthly fees paid to the Town are estimated at \$61.00 per active connection per month. The monthly miscellaneous lift station operation charges per active connection is estimated at \$7.00 per month. The estimated total monthly lift station fee for the users is \$68.00 per month.

As discussed in Section 2, the River Glen HOA will budget \$23,000 annually for repairs of the collection system. For River Glen HOA users, this equates to an additional \$30.00 per month. The combined monthly rate for River Glen HOA users is \$98.00 per month. The monthly rate for the Riverside Farms users is \$68.00 per month.

SECTION 6 – PROPOSED LIFT STATION AND IMPLEMENTATION SCHEDULE

PROJECT DESCRIPTION

The design of the lift station modifications will comply with the requirements specified in Chapter 4 of the WPC-DR-1 criteria. The major features of the proposed facilities include: 1) upgraded lift station equipment and automated flow measurement, 2) approximately 5,150 linear feet of 4-inch HDPE force main, 3) approximately 1,000 linear feet of 8-inch PVC gravity sanitary sewer main, 4) site upgrade to three-phase power and 5) proposed dual pump system with a pumping capacity of 80 gpm. The proposed lift station alignment and site location are presented in Figure 5.

The design of the proposed lift station will account for the buildout peak hour pumping capacity (as required by CDPHE for pumping systems), 115,200 gpd. The 80 gpm pumping capacity of the lift station was selected to provide a minimum velocity of 2 ft/s in the 4-inch force main. At the point of the Dry Creek Interceptor where the River Glen HOA flows contribute, the sanitary sewer main is 21-inch PVC with 7.4 cubic feet per second (cfs) of capacity. There are no existing flows in this portion of the Dry Creek Interceptor. Downstream the size of the interceptor increases to 24-inches and the current flow is 1.65 cfs, 15 percent of the total capacity. The interceptor and downstream interceptors, have sufficient capacity for the contributing flows from the River Glen HOA service area. The Berthoud WWTF capacity is 2.0 MGD and their current annual average flow is 0.6 MGD. The WWTF also has sufficient capacity to accept the additional flow from the River Glen HOA.

PROJECT IMPLEMENTATION

CDPHE issued a compliance schedule to River Glen HOA on September 15, 2011. Table 7 provides the dates and progress of the items outlined in the compliance schedule. Those items required by the compliance schedule have the required completion date noted in the "Due Date" column. Additional milestones are included in the implementation schedule to comply with the CDPHE Guidelines. These items are not associated with the compliance schedule and do not list a "Due Date".

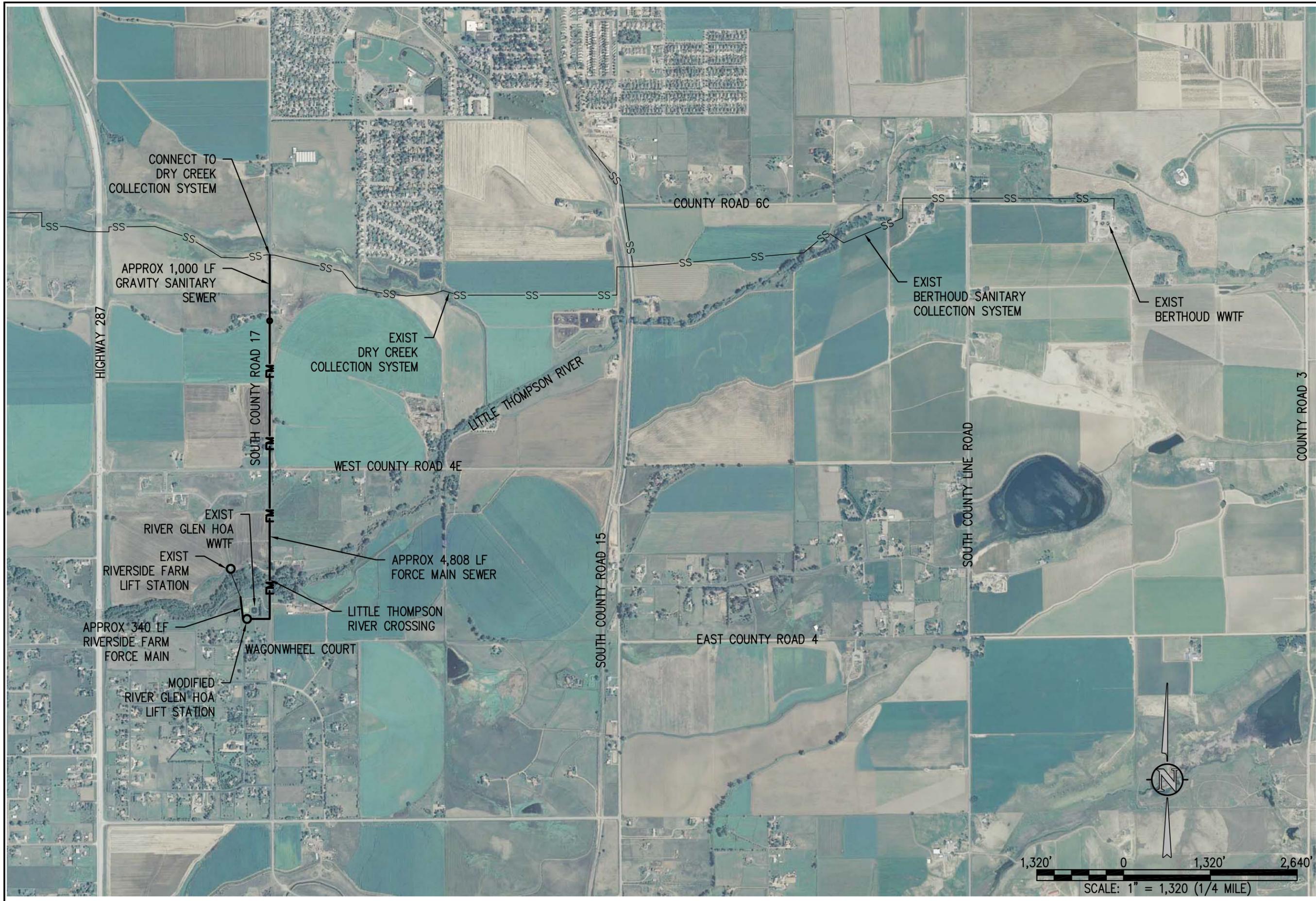


FIGURE 5 - LIFT STATION LOCATION AND FORCE MAIN ALIGNMENT
 RIVER GLEN HOA
 JUNE 2013

Table 7: CDPHE Compliance Schedule and Implementation Plan

Event	Due Date	Status
Hire a Consultant/Professional Engineer	March 2012	Complete (3/2012)
Formation of Local Improvement District		Complete (11/2012)
Plan, Report, or Scope of Project	December 2012	Complete (12/2012)
Application for SRF Funding Submitted		Complete (12/2012)
Environmental Assessment Submitted		Complete (2/2013)
Site Location Application	-	June 2013
Engineering Plan/Design Documents	June 2013	September 2013
SRF Funds Available		June 2013
Bid Construction Project		January 2014
Commence Required Work or On-Site Construction	June 2014	February 2014
Start-up of Lift Station/Complete Required Work	December 2016	July 2014
Status/Progress Report	June 2015	N/A
Status Progress Report	June 2015	N/A

The River Glen HOA held a public meeting regarding the project on February 23, 2012 to discuss the PER and the proposed alternatives. During this meeting, the River Glen HOA members voted to select the lift station as the preferred alternative.

A second public meeting with the required 30-day notice period occurred June 21, 2012. A legal notice was printed in the Berthoud and Loveland newspapers 30 days prior to the public meeting. A summary of the meeting is provided in Appendix G

The required site posting occurred March 2013. Photo documentation of this sign is provided in Appendix G. CDPHE site approval is anticipated by August 2013. The River Glen HOA anticipates submitting design documents by the end of June 2013. With bidding in September, construction is anticipated to begin in October 2013 and will require three months. Under the assumed scheduling conditions, the lift station and force main will be operational by early 2014.

For the implementation of the lift station schedule an Agreement between Berthoud and the LID was developed. The Agreement discusses the terms of the lift station ownership and designates the operation and maintenance responsibilities to the Town of Berthoud for an additional fee as previously discussed (Appendix D).

In addition, the existing Agreement between Riverside Farm and the River Glen HOA automatically terminates when the connection is made to the Town system. A new Agreement between the Riverside Farm HOA and the River Glen HOA to document the new operating conditions is in progress. The agreement will likely create a committee of property owners from both River Glen and Riverside Farm to oversee the operation of the facilities. Among other duties, that committee will create and manage a budget for the facilities; the funding for that budget will come from River Glen HOA and Riverside Farm HOA.

APPENDIX A – CDPHE SITE LOCATION APPLICATION FORM



Water Quality Control Division Engineering Section

4300 Cherry Creek Drive South, B2
Denver, Colorado 80246-1530
CDPHE.WQEngReview@state.co.us
303-692-6298

Colorado Department
of Public Health
and Environment

Regulation 22 Application Form

Section 22.7 of Regulation 22: Interceptor Sewers Not Eligible for Certification and Lift Stations

A. Project and System Information								
System Name	River Glen Homeowners Association Wastewater Treatment Facility							
Project Title	River Glen Homeowners Association Lift Station							
County	Larimer							
Date Fee Paid or payment attached	2/4/2013	Invoice Number and Check Number	220639, check#2131					
Design Company Name	JVA, Inc							
Design Engineer	Kevin A Tone	CO License Number	28699					
Address	1319 Spruce Street							
	Boulder, Colorado 80302							
Email	ktone@jvajva.com							
Phone	(303) 444.1951	Fax	(303) 444.1957					
Applicant / Entity	River Glen Homeowners Association (Larimer County LID 2012-1)							
Representative Name/Title	Michael Dower / Board Representative							
Address	P.O. Box 1251							
	Berthoud, Colorado 80513							
Email	Michael.Dower@emerson.com							
Phone	(303) 408.5862	Fax						
B. Project Information								
<i>Location (existing or proposed site)</i>			<i>Proposed Project Capacity</i>					
Brief location description	County Road 17 Berthoud, Colorado 80513		Maximum Month Average Hydraulic Capacity in million gallons per day (MGD)	0.031 MGD				
Legal Description (e.g., Township, Range)	SE 1/4 Section 27, T4N, R69W		Peak Hour Hydraulic Capacity in million gallons per day (MGD)	0.115 MGD				
County	Weld		Organic Capacity (lbs. BOD ₅ /day) – Treatment Facility Only	52 lbs. BOD ₅ /day				
Latitude	40.278116667 deg							
Longitude	105.092683333 deg							
Funding Process	Will a State or Federal grant or loan be sought to finance any portion of the project (e.g., State Revolving Fund)?		No	<input type="checkbox"/>	Yes	<input checked="" type="checkbox"/>	If yes, please list project number	100006W
Project Schedule and Cost Estimate								
Estimated Bid Opening Date	January 2014							
Estimated Completion Date	July 2014							
Estimated Project Cost	\$1,160,500							

Regulation 22 Application Form

Section 22.7 of Regulation 22: Interceptor Sewers Not Eligible for Certification and Lift Stations

Project and System Information	
Project Title	River Glen Homeowners Association Lift Station
System Name	River Glen Homeowners Association Wastewater Treatment Facility
County	Larimer
Interceptor/Lift Station Design Information	
1.	a) Name and address of wastewater treatment facility providing treatment (Receiving wastewater facility must fill out "Receiving Wastewater Entity Certification") <i>Town of Berthoud Wastewater Treatment Facility 20210 WCR #1 Berthoud CO 80513</i>
Site Information	
2.	Vicinity maps of facility location which includes the following: a) 1 mile radius map: habitable buildings, location of public and private potable water wells, an approximate indication of the topography, and neighboring land uses <i>A 1-mile radius map is provided as Figure 3 in the Site Application Report</i>
3.	Site Location Zoning a) Present zoning of the site location? <i>FA1 - Farming</i> b) Zoning within a one (1) mile radius of the site? For New Lift Stations Only. <i>FA1 - Farming</i>
4.	Floodplain or Natural Hazards a) Is the facility located in a 100-year floodplain or other natural hazard area? If so, what precautions are being taken? <i>The facility is located within the revised 100-year floodplain. Flood proofing precautions are being taken that include: extending the top of wet well elevation and the over flow storage elevation 18 inches above the flood elevation and development of a flood proofing plan (if necessary). As discussed in the Site Location Application Report, the flood proofing measures will be further developed during the design phase.</i> b) Has the floodplain been designated by the Colorado Water Conservation Board, Department of Natural Resources or other agency? If so, please list agency name and the designation. <i>Yes, the floodplain has been designated by Federal Emergency Management Agency as Zone AE. The floodplain map is provided in the Preliminary Engineering Report, Appendix B of the Site Location Application Report</i>
5.	Land Ownership a) Who owns the land upon which the facility will be constructed? Please attach copies of the document(s) creating authority for the applicant to construct the proposed facility at this site. <i>The land is owned by the River Glen Homeowners' Association. The legal control of the site is provided in Appendix E of the Site Location Application Report.</i>
Lift Station Facility Only	
6.	Please describe the period during which service area build-out will occur. <i>Based on the current regional growth rates, build-out conditions will occur in approximately 88 years. The 0.55 percent growth rate projected for the 20-year planning period increases the population by 11 percent over the 20-year planning period.</i>
7.	Please describe the flows expected in the first five years and ten years of operation. <i>In the first five years the average daily flow is projected as 15,390 gpd, peak hour flow is projected as 61,500 gpd. The ten year projected average daily flow is projected as 16,400 gpd, peak hour flow is projected as 65,000 gpd.</i>
8.	Will the proposed lift station replace an existing lift station? Yes <input type="checkbox"/> No <input checked="" type="checkbox"/>

If Yes, please describe the current flows and loadings that will be switched to the proposed lift station.

The lift station at the existing River Glen HOA WWTF will be modified to construct the new lift station required to transfer waste to the Town of Berthoud WWTF. The lift station is new for this purpose.

9. Describe emergency back-up system in case of lift station and/or power failure.

A standby diesel generator will be provided for the modified lift station. The generator will provide back-up power to the lift station pumps, controls, and automated flow meter in the event of power loss. Emergency overflow storage will be provided at the existing WWTF site and will be sized to provide sufficient volume for emergency response to restore power or replace equipment in the event of an emergency. The Berthoud WWTF operator response for all lift stations in the service area is 30 minutes. To provide a sufficient safety factor, three hours of emergency overflow storage will be provided. At average buildout flow conditions (24,660 gpd), this equates to 3,100 gallons of overflow storage. The final design of emergency overflow storage will be developed during the design phase

Project Information

10. a) What entity is financially responsible for the construction of the facility?

The local improvement district (LID) formed between Larimer County, the River Glen HOA, and Riverside Farms HOA.

11. a) What entity has the financial responsibility for owning and long term operating expense of the proposed facility?

The River Glen and Riverside Farm HOAs have formed an agreement with the Town of Berthoud to operate and maintain the lift station throughout the 20-year loan repayment period. Ownership will be transferred to the Town after the loan has been repaid.

12. a) What entity has the responsibility for managing and operating the proposed facility after construction?

The Town of Berthoud will be responsible for operating the proposed facility as outlined in the Agreement provided as Appendix C of the Site Location Application Report.

Additional Factors

13. Please identify any additional factors that might help the Water Quality Control Division make an informed decision on your site location application.



Water Quality Control Division Engineering Section

4300 Cherry Creek Drive South, B2
Denver, Colorado 80246-1530
CDPHE.WQEngReview@state.co.us
303-692-6298

Colorado Department
of Public Health
and Environment

Applicant Certification and Review Agencies Recommendation Section 22.7 of Regulation 22: Interceptor Sewers Not Eligible for Certification and Lift Stations

A. Project and System Information	
System Name	River Glen Homeowners Association Wastewater Treatment Facility
Project Title	River Glen Homeowners Association Lift Station
County	Larimer

1. Applicant Certification

I certify that I am familiar with the requirement of Regulation 22 - Site Location and Design Approval Regulations for Domestic Wastewater Treatment Works, and have posted the site in accordance with the Regulations. An engineering report, as described by the regulations, has been prepared and is enclosed.

Applicant Legal Representative (e.g. Public Works Director)	Date	Typed Name	Signature
HOMEDOWNER AND SEWER CHAIRMAN	11 JUNE 2013	MICHAEL DOWER	

The system legal representative is the legally responsible agent and decision-making authority (e.g. mayor, president of a board, public works director, owner). The Consulting Engineer is not the legal representative and cannot sign this form.

2. Recommendation of Review Agencies

As required in Section 22.7(2 and 3), the application and the engineering report must be submitted to all appropriate local governments, 208 planning agencies and State agencies for review and comment prior to submittal to the Division. By signing below, the entity or agency: 1) acknowledges receipt of the proposed site location application, 2) has reviewed the proposed site location application and may elect to provide comments, and 3) has provided a recommendation to the Division. The recommendation should be based on the consistency of the proposed site location application with the local comprehensive plan(s) as they relate to water quality and any adopted water quality management plans(s). Please note: If a governmental authority does not recommend approval then the authority must attached a letter describing the reason for their decision or comment on the next page.

Signature of County, if proposed facility is located in unincorporated areas of a county			
Role	Date	Typed Name / Agency	Signature
PRINCIPAL PLANNER	6/12/13	Larimer County Planning	
			Recommend Approval? Yes <input type="checkbox"/> No <input checked="" type="checkbox"/>
Signature of City or Town, if site is located within three miles of the City/Town boundary			
Role	Date	Typed Name / Agency	Signature
Town Administrator	6/11/13	Michael J. Hart Hart-Bertrand	
			Recommend Approval? Yes <input checked="" type="checkbox"/> No <input type="checkbox"/>
Signature of Local Health Authority			
Role	Date	Typed Name / Agency	Signature
Env. Health	6/12/13	Ed Schermer Hammer Health	
			Recommend Approval? Yes <input checked="" type="checkbox"/> No <input type="checkbox"/>
Signature of 208 Planning Agency			
Role	Date	Typed Name / Agency	Signature
MANAGER	6/27/13	NFRWQPA Warren Mesick PE	
			Recommend Approval? Yes <input checked="" type="checkbox"/> No <input type="checkbox"/>

Signature of Other State or Federal Agencies, if facility is located on or adjacent to a site that is owned or managed by a federal or state agency.

Role	Date	Typed Name / Agency	Signature				
			Recommend Approval?	Yes	<input type="checkbox"/>	No	<input type="checkbox"/>

Review Agency Comments:



Water Quality Control Division Engineering Section

4300 Cherry Creek Drive South, B2
Denver, Colorado 80246-1530
CDPHE.WQEngReview@state.co.us
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and Environment

Wastewater Receiving Entity Certification

Section 22.7 of Regulation 22: Interceptor Sewers Not Eligible for Certification and Lift Stations

Project and System Information	
System Name	River Glen Homeowners Association Wastewater Treatment Facility
Project Title	River Glen Homeowners Association Lift Station
County	Larimer

Receiving Wastewater Entity – Certification of Available Treatment Capacity

Receiving wastewater treatment entity information			
Receiving wastewater treatment entity and facility	Berthoud Wastewater Treatment Facility		
County	Weld		
CDPS discharge permit number and expiration date	0046663, 8/31/14	CDPS discharge permit capacity	2 MGD
Site location approval number and date (please attach a copy of approval letter)	#4694, 4/23/04	Site location approved capacity	2 MGD

Proposed facility capacity impacts on receiving wastewater treatment facility (projected at buildout or 20-years)

Proposed project hydraulic capacity: maximum month average	0.031 million gallons per day		
Proposed project hydraulic capacity: peak hour	0.11520 million gallons per day		
Proposed project organic capacity: maximum month average	52 lbs BOD ₅ /day		
Proposed project will increase the receiving treatment facility's hydraulic loading capacity to (% of total capacity):	51%		
Proposed project will increase the receiving treatment facility's organic loading capacity to (% of total capacity):	31%		

Treatment Certification (22.7 (1)(f) (i))

I certify that the receiving wastewater treatment facility will treat the wastewater from the proposed wastewater facility project.

Yes, will provide treatment	<input checked="" type="checkbox"/>	No, will not provide treatment	<input type="checkbox"/>
-----------------------------	-------------------------------------	--------------------------------	--------------------------

Capacity Certification (22.7 (1)(f) (ii))

I certify that the receiving wastewater treatment facility is not presently receiving wastes (hydraulic and organic loads) in excess of the above listed site location approval and discharge permit to treat the projected discharge from the new interceptor sewer or from the new or expanded lift station, as listed above (initial in box). MA

OR

I certify that the receiving wastewater treatment facility does not currently have the capacity to serve the proposed project flows but is under construction, or will be in a phased construction of new or expanded facilities and will have the necessary capacity to treat the projected discharge from the new interceptor sewer or from the new or expanded lift station, as listed above (initial in box).

Estimated date capacity will be available

Note: Projections of flow and loading to the treatment facility over the period during which build out of the service area will occur or twenty years, whichever is less, as well as current and future plant capacity information must be provided to demonstrate the plan for maintaining adequate treatment capacity. Any proposed treatment plant phased construction must be shown in the Water Quality Management Plan (reference, attach), or by appropriate planning and engineering studies (reference, attach).

Compliance Status Certification (22.7 (1)(f) (iii))

I certify that the receiving wastewater treatment facility has not been in violation of any effluent limitations in its discharge permit for the last two years (initial in box). MA

I certify that the receiving wastewater treatment facility is not operating under a Notice of Violation and/or Cease and Desist Order from the Division resulting from discharge permit violations (initial in box).

Note: If there have been effluent violations or if the receiving wastewater treatment facility is operating under a Notice of Violation and/or Cease and Desist Order from the Division, please provide additional description of the situation and the treatment entity's proposed corrective measures to achieve consistent compliance. The Division will evaluate information provided and determine if approval should be granted, granted with conditions, or denied.

I hereby certify that the information presented above is accurate and complete.

Receiving Treatment Facility Representative	Date	Typed Name and Title	Signature
Michael S. Hart	6/11 2013	Town Administrator	

STATE OF COLORADO

Bill Owens, Governor
Douglas H. Benevento, Executive Director

Dedicated to protecting and improving the health and environment of the people of Colorado

4300 Cherry Creek Dr. S. Laboratory Services Division
Denver, Colorado 80246-1530 8100 Lowry Blvd.
Phone (303) 692-2000 Denver, Colorado 80230-6928
TDD Line (303) 691-7700 (303) 692-3090
Located in Glendale, Colorado
<http://www.cdphe.state.co.us>



Colorado Department
of Public Health
and Environment

April 23, 2004

Town of Berthoud
Attn: James J. White, Town Administrator
PO Box 1229
Berthoud, CO 80513

Re: Site Application #4694
 Weld County

Dear Mr. White:

The Water Quality Control Division has reviewed and evaluated your site application and supporting documentation for construction to expand the Berthoud Wastewater Treatment Plant (WWTP) to 2.0 mgd. The existing treatment facility is located in the SE ¼ of the SW ¼ of Section 19, Township 4N, Range 68W in Weld County. The treatment facility will discharge to the Little Thompson River stream segment COSPBT09.

Prior to the operation of the facility, a discharge permit will be required which will specify the final conditions and limitations applicable to the facilities operation. The treatment processes to be used include: screening and flow measurement, grit removal, activated sludge aeration basins, final clarifiers, and UV disinfection. Infrastructure improvements are needed to replace the old WWTP and provide redundancy for the existing 1.0 mgd WWTP.

We find your application to be in conformance with the Water Quality Control Commission's "Regulations for the Site Application Process". Therefore, the site application is approved with the following conditions listed below.

1. Based upon application information, the system design will be for:
 Maximum Month Capacity – 2.0 MGD
 Organic Loading Capacity – 3,900 lbs. BOD₅/day
2. Preliminary Effluent Limits:
 BOD₅
 30/45 mg/l (30-day average/7-day average)

 Suspended Solids
 30/45 mg/l (30-day average/7-day average)

Fecal Coliform

200/400 #/100ml (30-day average/7-day average)

Total Residual Chlorine

0.011/0.019 mg/l (30-day average/daily maximum)

pH

6.5-9.0 s.u. (minimum-maximum)

Oil and Grease

10 mg/l (daily maximum)

Total Ammonia (mg/l)

January	*/19.0	(30-day average/daily maximum)
February	20.0/20.0	(30-day average/daily maximum)
March	17.0/18.0	(30-day average/daily maximum)
April	12.0/18.0	(30-day average/daily maximum)
May	12.0/18.0	(30-day average/daily maximum)
June	12.0/18.0	(30-day average/daily maximum)
July	12.0/18.0	(30-day average/daily maximum)
August	9.3/17.0	(30-day average/daily maximum)
September	9.4/18.0	(30-day average/daily maximum)
October	13.0/18.0	(30-day average/daily maximum)
November	18.0/19.0	(30-day average/daily maximum)
December	*/19.0	(30-day average/daily maximum)

*** Attainment of the daily maximum (acute) will protect chronic water quality without the mandatory need for a monthly average limit.**

Design for values in excess of those contained in conditions 1 and 2 above, or failure to comply with any other conditions contained herein, will render this approval void and another site application will have to be processed.

3. This site approval will expire in one year from the date of this letter if the construction of the project has not commenced by that date. If expiration occurs, you must apply for a new site approval. Construction is defined as entering into a contract for the erection or physical placement of materials, equipment, piping, earthwork, or buildings that are to be a part of a domestic wastewater treatment works.
4. The design (construction plans and specifications) for the facility must be approved by the Division prior to commencement of construction. The criteria and applicable procedures are defined in Policy 96-1, Design Criteria Considered in the Review of Wastewater Treatment Facilities, revised May 14, 2002. Please note the design criteria require the submittal of a Process Design Report for the wastewater treatment facility. All construction change orders initiating variances from the approved plans and specifications must be approved by the Division.
5. The applicant's registered engineer must furnish a statement prior to the commencement of operation stating that the facilities were constructed in conformance with approved plans, specifications, and change orders.

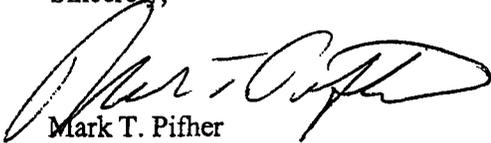
6. In 2002, the Little Thompson River was listed on Colorado's 303(d) list for fecal coliform and selenium. Please be aware that future effluent limits may be affected by this change.
7. To ensure protection of Waters of the State (surface or subsurface water) and the surrounding environment the old wastewater treatment must be properly decommissioned. Please refer to the attached draft Lagoon Abandonment and Treatment Works Closure Procedure at Wastewater Treatment Facilities for further information. Please provide a decommissioning plan to your District Engineer Brad Simons for approval.

In accordance with Colorado Water Quality Control Commission regulations, this approval is subject to appeal as stated under Section 22.8 (7) of "Regulations for the Site Application Process".

This approval does not relieve the owner from compliance with all local regulations prior to construction nor from responsibility for proper engineering, construction, and operation of the facility.

Attached to this letter you will find a Customer Satisfaction Survey. We would greatly appreciate it if you would take a few moments to complete this survey and return it to us. Simply fill out the form, fold it according to the directions and drop it in the mail. The postage is already paid! Thank you for your time.

Sincerely,

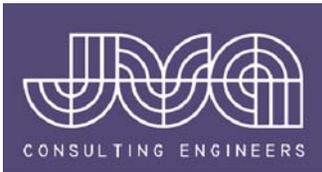


Mark T. Pifher
Director
Water Quality Control Division

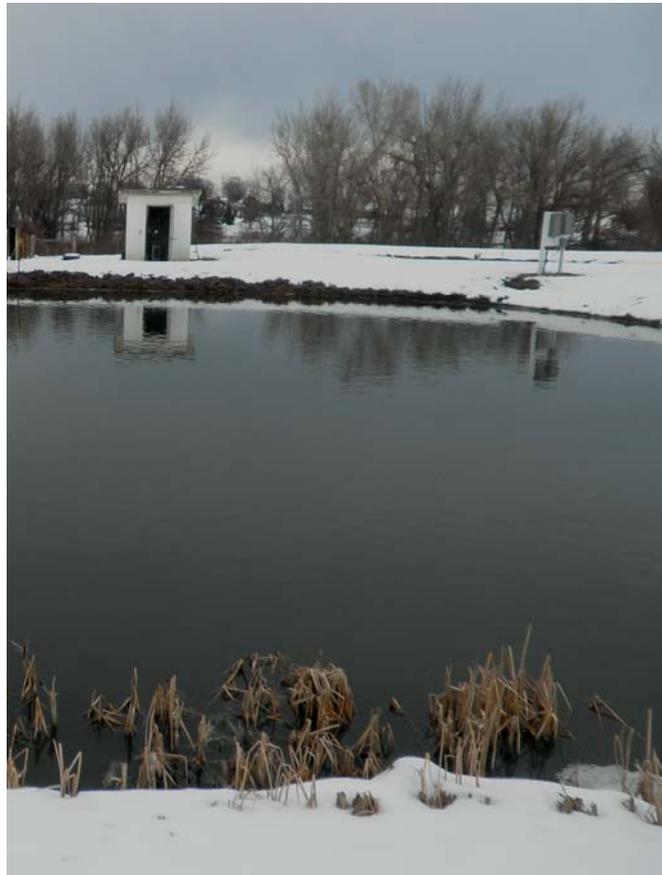
MTP: rkk
Enclosure

cc: R. Kent Kuster, Environmental Protection Specialist, WQCD
Brad Simons, District Engineer, WQCD-Denver
Gary Beers, Permits Unit, WQCD
Randy Ristau, Watershed Coordinator, WQCD (email)
Trevor Jiricek, Weld County Department of Public Health and Environment
Lela S. Parsons Black & Veatch, 11900 East Cornell Avenue, Suite 300, Aurora, CO 80014

APPENDIX B – PRELIMINARY ENGINEERING REPORT



PRELIMINARY ENGINEERING REPORT
FOR THE
RIVER GLEN HOMEOWNERS ASSOCIATION



WASTEWATER TREATMENT FACILITY

NOVEMBER 26, 2012

PRELIMINARY ENGINEERING REPORT

WASTEWATER TREATMENT FACILITY

FOR

RIVER GLEN HOME OWNERS ASSOCIATION

JVA, Inc.

1319 Spruce Street

Boulder, CO 80302

phone: 303-444-1951

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JVA Project No. 1862c

NOVEMBER 26, 2012

TABLE OF CONTENTS

SECTION 1 – EXECUTIVE SUMMARY	1
SECTION 2 – PLANNING CONDITIONS.....	2
PLANNING AREA	2
SITE LOCATION	2
FLOODPLAIN	2
WETLANDS	4
208 PLAN COORDINATION	4
GROWTH AREAS AND POPULATION TRENDS	4
WASTEWATER FLOW FORECASTS	6
CURRENT FLOWS.....	6
PEAKING FACTORS.....	7
PROJECTED FLOW.....	7
WASTELOAD FORECASTS	8
CURRENT LOADING.....	8
PROJECTED LOADING	9
SECTION 3 – EXISTING FACILITIES	10
INTRODUCTION	10
SERVICE AREA FEATURES	10
AREA DISCHARGE PERMITS.....	14
FACILITIES LAYOUT AND DESCRIPTION	14
INFLUENT PUMPING STATION	14
HEADWORKS	15
AERATION PROCESS.....	15
CLARIFICATION.....	15
SLUDGE HANDLING	16
DISINFECTION AND DECHLORINATION	16
EXISTING WASTEWATER FLOWS.....	16
FINANCIAL STATUS AND USERS	17
SECTION 4 – PROJECT PURPOSE AND NEED	18
COMPLIANCE	18
SECURITY	18
OPERATION AND MAINTENANCE (O&M).....	18
GROWTH.....	18
SECTION 5 – ALTERNATIVES ASSESSMENT.....	20
DESIGN CRITERIA.....	20
DESCRIPTION.....	21
ALTERNATIVES 2 THRU 4 – CONSOLIDATION	24

ALTERNATIVE 2 – CONNECTION TO THE BERTHOUD WWTP AT THE DRY CREEK INTERCEPTOR SEWER	24
ALTERNATIVE 3 – CONNECTION TO THE BERTHOUD WWTP AT THE BERTHOUD COLLECTION SYSTEM (C.R. 15).....	25
ALTERNATIVE 4 – CONNECTION AT THE BERTHOUD WWTP.....	27
ENVIRONMENTAL IMPACTS.....	30
ALTERNATIVE 1.....	30
ALTERNATIVE 2.....	30
ALTERNATIVE 3.....	30
ALTERNATIVE 4.....	31
LAND REQUIREMENTS	31
CONSTRUCTION PROBLEMS	32
OPERATIONAL ASPECTS	32
COST ESTIMATES.....	32
ADVANTAGES & DISADVANTAGES	33
SECTION 6 – SELECTED ALTERNATIVE	34
JUSTIFICATION OF SELECTED ALTERNATIVE	34
TECHNICAL DESCRIPTION	35
ENVIRONMENTAL REVIEW OF SELECTED ALTERNATIVE	35
GREEN PROJECT RESERVE	37
COSTS.....	37
CURRENT AND PROJECTED USER RATES.....	37
PROJECT IMPLEMENTATION.....	38
PRELIMINARY EFFLUENT LIMITS.....	39

LIST OF TABLES

TABLE 1 – POPULATION AND WATER TAP CONNECTION (EQR) PROJECTIONS	6
TABLE 2: MONTHLY INFLUENT WASTEWATER FLOWS	6
TABLE 3: BUILDOUT POPULATION AND FLOW PROJECTIONS	8
TABLE 4: PROJECTED WASTEWATER CHARACTERISTICS AND LOADS AT 25,000 GPD	9
TABLE 5: COLORADO DISCHARGE PERMIT NO. CO-0029742	14
TABLE 6: DESIGN PARAMETERS.....	21
TABLE 7: ALTERNATIVE 1 – CAPITAL, O&M, AND PRESENT WORTH (2012 DOLLARS).....	22
TABLE 8: ALTERNATIVE 2 – CAPITAL, O&M, AND PRESENT WORTH (2012 DOLLARS).....	25
TABLE 9: ALTERNATIVE 3 – CAPITAL, O&M, AND PRESENT WORTH (2012 DOLLARS).....	27
TABLE 10: ALTERNATIVE 4 – CAPITAL, O&M, AND PRESENT WORTH (2012 DOLLARS).....	27
TABLE 11: SUMMARY OF CAPITAL, O&M, AND PRESENT WORTH (2012 DOLLARS) – BUILDOUT DESIGN	33
TABLE 12: ALTERNATIVES ANALYSIS DECISION MATRIX.....	34

TABLE 13: SUMMARY OF THE OPINION OF PROBABLE COST FOR ALTERNATIVE 2	37
TABLE 14: CDPHE COMPLIANCE SCHEDULE	38

LIST OF FIGURES

FIGURE 1: SERVICE AREA BOUNDARY	3
FIGURE 2: WETLANDS.....	5
FIGURE 3: RIVER GLEN WWTF PROCESS DIAGRAM.....	11
FIGURE 4: 1-MILE RADIUS MAP	12
FIGURE 5: 5-MILE RADIUS MAP	13
FIGURE 6: ALTERNATIVE 1	23
FIGURE 7: ALTERNATIVE 2	26
FIGURE 8: ALTERNATIVE 3	28
FIGURE 9: ALTERNATIVE 4	29
FIGURE 10: PROPOSED ALTERNATIVE PROCESS SCHEMATIC	36

APPENDICES

APPENDIX A–CDPHE FORMS.....	1
APPENDIX B – FLOODPLAIN INFORMATION.....	2
APPENDIX C – EXISTING AND PROJECTED FLOW CONDITIONS	3
APPENDIX D –HISTORICAL WASTEWATER QUALITY DATA	4
APPENDIX E – FINANCIAL INFORMATION.....	5
APPENDIX F – OPINION OF PROBABLE COST.....	6
APPENDIX G – FLUIDYNE SBR INFORMATION.....	7

SECTION 1 –EXECUTIVE SUMMARY

The River Glen Homeowners Association (River Glen HOA) is a small subdivision located near the intersection of County Road 17 and County Road 4E in Larimer County. Currently, the subdivision is 98 percent developed, with one lot remaining. The River Glen HOA Wastewater Treatment Facility (WWTF) serves the River Glen Subdivision and the Riverside Farms Subdivision. The Riverside Farms Subdivision is only 8 percent developed. Residential development over a 20-year planning period is anticipated to continue within the Riverside Farms Subdivision.

The WWTF consists of two influent pumping stations that pump wastewater into two aerated lagoons, followed by a polishing pond and a sodium hypochlorite chlorination system for disinfection. A chlorine contact tank provides disinfection contact time and a tablet dechlorination system was installed in 2011 for dechlorination purposes. The treated effluent is discharged through a 6-inch PVC outfall pipeline to the Little Thompson River discharge point.

The WWTF was constructed in 1974 and was upgraded in 2005 to incorporate sanitary sewer flows from the Riverside Farms development. The Colorado Department of Public Health and Environment (CDPHE) has notified River Glen HOA that the WWTF's renewed discharge permit will incorporate effluent ammonia and residual chlorine limits beginning January 1, 2017. The current treatment process is not capable of meeting the future CDPHE discharge criteria. The existing treatment process is permitted for a hydraulic load of 0.029 million gallons per day (MGD) and an organic load of 52 pounds BOD per day (lbs BOD/day).

In order to comply with CDPHE regulations and meet the effluent criteria of the 2017 discharge permit, the River Glen HOA has elected to decommission their existing WWTF and consolidate with the Town of Berthoud's Wastewater Treatment Plant (WWTP). The recommended alignment for this connection is to the Dry Creek Interceptor Sewer, north of County Road 4E. To provide the most economical solution, the existing lift station will be designed for buildout conditions and will require modifications to meet the new pumping requirements. This alternative has the lowest life cycle cost and reduces the maintenance requirements for the River Glen HOA considerably. The opinion of probable cost for the modified lift station and proposed force main is \$1,160,500 including engineering, construction, contingency, and overhead and profit.

SECTION 2 – PLANNING CONDITIONS

PLANNING AREA

The service area for the WWTF includes 65 lots in the River Glen Subdivision and 45 lots in the Riverside Farms Subdivision. All 65 lots in the River Glen Subdivision have been platted and 21 of the 45 lots in the Riverside Farms Subdivision have been platted, for a total of 86 platted lots in the service area. The service area of the WWTF is provided in Figure 1. The service area encompasses approximately 279 acres and currently serves 68 connections. There is no option for the service area to grow beyond the existing boundaries. The maximum number of sanitary sewer connections within the service area, including unplatted lots, is 110.

SITE LOCATION

The existing WWTF is located at the northwest corner of County Road 17 and Wagonwheel Court in Berthoud, Colorado. The legal description for the facility is the SE ¼, of Section 27, Township 4N, Range 69W. The latitude and longitude of the facility is 40°16'41.22" North and 105°5'33.66" West. The WWTF discharges into the Little Thompson River at discharge point 001A, located at 40°17'36.15" North and 105°3'33.62" West.

FLOODPLAIN

The existing facility is located approximately 250 feet south of the Little Thompson River. The 100-year floodplain map was recently modified and is in the final stages of the Federal Emergency Management Agency's (FEMA) approval process. Changes to the 100-year flood map show the entire WWTF property within the floodplain boundaries. The proposed Flood Insurance Rate Map (FIRM) is provided in Appendix B.

In order to create the new flood maps for the Little Thompson River, FEMA conducted a study to re-evaluate the 1974 floodplain evaluation. The 2011 floodplain evaluation used the NGVD29 vertical datum for the evaluation and shows the 100-year flood elevation as 4,984 feet above mean sea level at the existing WWTF property. The 2011 Flood Insurance Study published by FEMA based on these results, as well as the corresponding FIRMs, use the NAVD88 vertical control datum and shows the 100-year flood elevation at the existing facility as 4,988 feet above mean sea level.

The existing facility plans denote the top of berm elevation for the aeration lagoons as 4,990 feet; however, the datum used for the development of these plans is not noted. Prior to the design of a new facility or lift station on the existing property, survey information will be required to determine the actual elevation on-site. In the event that the top of berm elevation is accurate in the NGVD 29 or NAVD88 vertical datum at 4,990 feet, the River Glen HOA can submit a letter of map amendment to FEMA. The letter of map amendment will effectively remove the

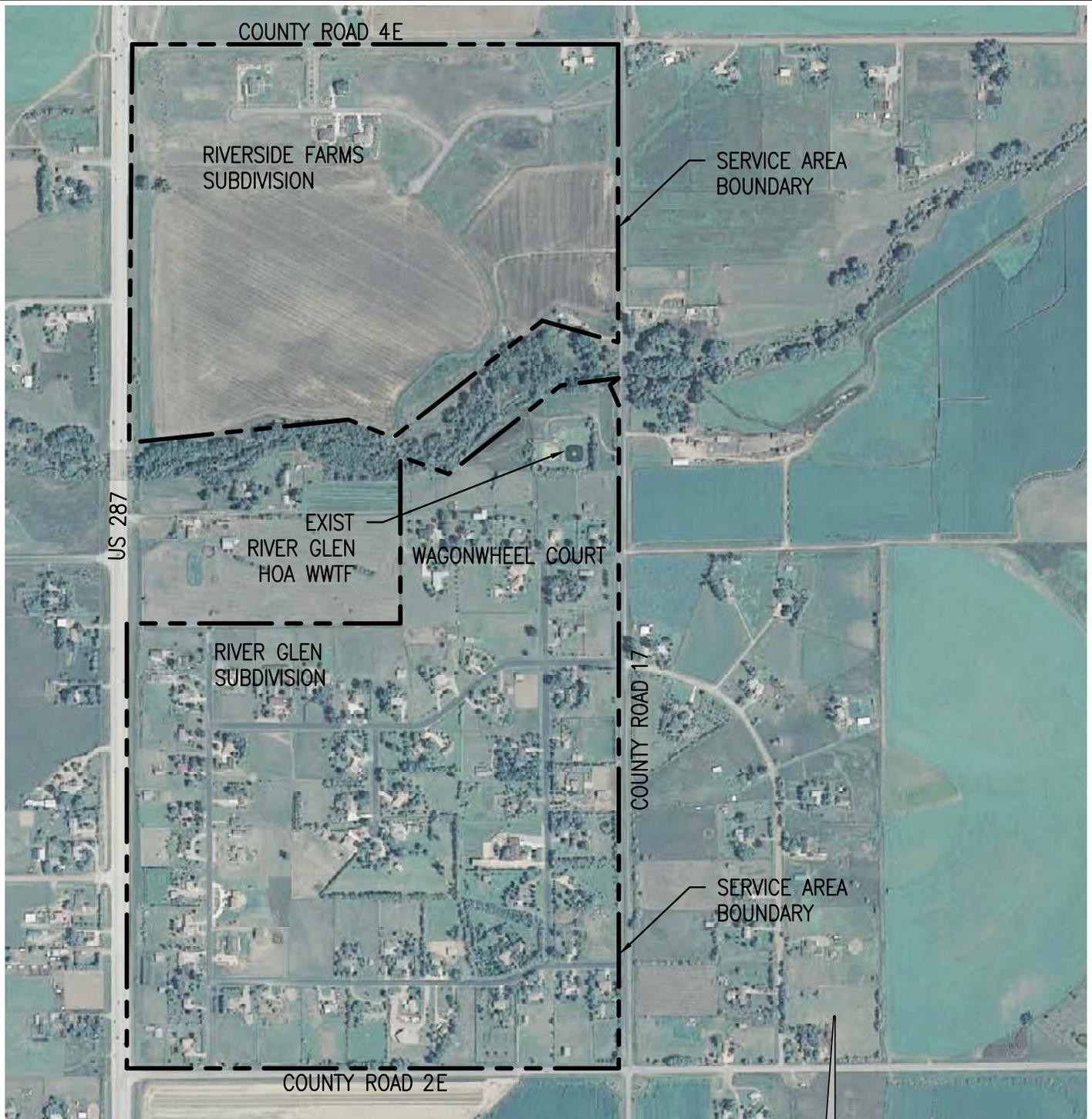


FIGURE 1 - SERVICE AREA
 RIVER GLEN HOA WWTF
 MAY 2012



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from the 100-year floodplain under these circumstances. If the property is found to be at an elevation under the 100-year flood elevation as noted by the FEMA studies, this will need to be taken into account during the design phase.

WETLANDS

According to the National Wetlands Inventory, the WWTF is not located in a delineated wetland area. It is near a riverine system, which is characterized by low gradient and slow velocity water. The locations of the wetlands with respect to the WWTF are shown in Figure 2.

208 PLAN COORDINATION

The North Front Range Water Quality Planning Association (NFRWQPA) is the 208 Water Quality Planning Agency for Larimer and Weld County. The service area is currently part of the 208 Plan.

GROWTH AREAS AND POPULATION TRENDS

The current population of the River Glen Subdivision is 150 residents and the population of the Riverside Farms Subdivision is 12 residents; therefore, the total service area population is 162 residents. There are currently 68 equivalent resident units (EQRs) within the service area boundaries, 64 connections in the River Glen Subdivision and 4 connections in the Riverside Farms Subdivision. This indicates an average household population density of 2.38 people per household. This is lower than the average household size in the Town of Berthoud, 2.52 people per household, according to the 2010 U.S. Census. For conservative planning purposes, a household population density of 2.5 people per household will be used to estimate projected wastewater flows through buildout.

The 2010 U.S. Census data lists the Berthoud population as 5,105 residents. According to the 2000 U.S. Census, the population residing in Berthoud was 4,839 residents. This indicates a growth rate of 0.55 percent per year. This contrasts with Larimer County's annual growth rate of 1.9 percent per year. The difference may be influenced by various economic, social, and geographical characteristics. Unless there is some unforeseen demographic shift, it is not likely that the service area will exceed the calculated historic growth rate of Berthoud, 0.55 percent. The service area has a maximum of 110 potential sanitary sewer connections at buildout conditions. Using a population density of 2.5, the buildout population is 275 residents. With a 0.55 percent annual growth rate, the 20-year population is 190 people and 76 EQRs.

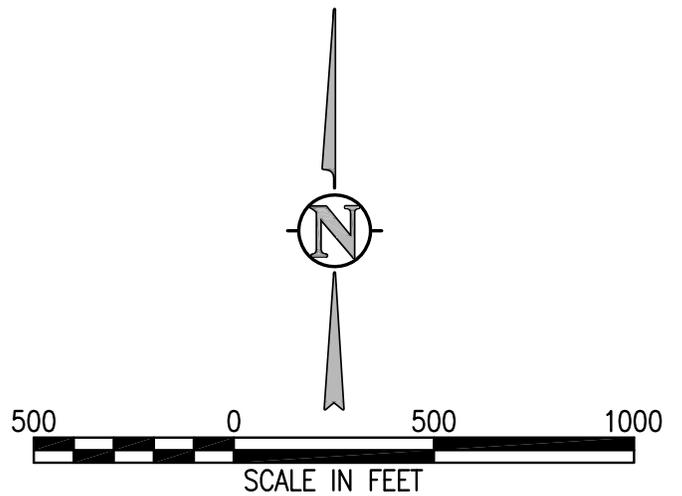


FIGURE 2 - WETLANDS
RIVER GLEN HOA WWTF
MAY 2012



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Table 1 – Population and Water Tap Connection (EQR) Projections

Year	EQRs	Population
2015	69	172
2020	71	177
2025	73	182
2030	75	187
2033	76	190
Buildout	110	275

The boundaries of growth for the service area were shown in Figure 1 and are consistent with the existing District service area. There are no areas of concentrated growth noted within the service area at this time.

WASTEWATER FLOW FORECASTS

CURRENT FLOWS

The influent flow to the WWTF is metered and reported monthly to CDPHE using Discharge Monitoring Reports (DMR), this data has been used to determine the average and daily maximum influent flows to the WWTF. The monthly average flow is 0.017 MGD with a peak day flow of 0.024 MGD. The WWTF's monthly-metered influent data is shown Table 2. The per capita flow rates are calculated based on the current population of 162 residents. Influent flow from 2008 through 2010 is provided in detail in Appendix D.

Table 2: Monthly Influent Wastewater Flows

Month	Average Daily Flow (gpd)	Peak Day Flow (gpd)	Daily Per Capita Flow (gpcd)
January, 2009	13,000	26,000	80
February, 2009	13,000	13,000	80
March	17,000	18,000	105
April	23,000	28,000	142
May	14,000	28,000	86
June, 2009	16,600	17,600	103
July, 2009	28,000	31,000	173
August	15,000	28,000	93
September	14,000	20,000	86
October	13,000	31,000	80
November	19,000	25,000	117
December, 2008	11,400	14,700	70
Average	16,417	23,358	101

Average monthly wastewater flow data was compiled using results from 2008 thru 2010. A few of the monthly DMRs did not provide recorded data; in these instances, results from previous years were used. The annual average flow was determined to be 16,417 gallons per day (gpd). The average per capita wastewater flow is estimated at 101 gpd. The CDPHE Design Criteria

states that wastewater treatment plants should be designed based on an average daily per capita (gpcd) wastewater flow of not less than 70 gallons or greater than 100 gallons. The service area's estimated average per capita flow rate of 101 gpcd is slightly higher than the maximum allowable flow per the Design Criteria. Based on a preliminary review of the River Glen HOA collection system, the elevated per capita flow to the WWTF is attributed to infiltration and inflow (I/I) and/or inaccurate influent flow measurement.

PEAKING FACTORS

The maximum month peaking factor was calculated using the highest average monthly flow (28,000 gpd) and dividing that figure by the average daily flow. Using this method, the maximum month peaking factor is 1.7. The maximum month flow calculated from existing data is higher than anticipated. Typical values for maximum month peaking factors are typically 1.25. Noting the inconsistencies that have been reported regarding the influent flow monitor, the typical 1.25 peaking factor will be used for design purposes. Based on this factor, the maximum month flow is 20,522 gpd. The historical data from the facility demonstrates an average peak day flow of 23,358 gpd. Based on the peak day flow, the daily peaking factor is 1.5. The WWTF does not record the instantaneous peak flow (peak hour); therefore, there is no historical data available to calculate a peak hour flow factor. Based on Metcalf & Eddy's *Wastewater Treatment*, for small towns with a similar population to the River Glen HOA's service area, the influent hourly peaking factor for the WWTF is estimated to be 4.0. Using this peaking factor, the existing estimated peak hour flow is 65,667 gpd.

PROJECTED FLOW

Buildout population is 275 people based on 110 connections and 2.5 people per household. The 20-year projected population is 190 residents and 76 EQRs, based on the 0.55 percent annual growth rate and a population density of 2.5 people per household. Collection system improvements are currently underway to address the system's I/I flows. As a result of these repairs, the average per capita flow is anticipated to decrease by approximately 10 gpcd. The I/I maintenance occurring within the service area is further discussed in Section 3. To account for the reduction in I/I, the estimated per capita flow projections are 90 gallons per capita per day.

Based on the reduced average per capita flow rate of 90 gpcd, the projected average daily flow for the 20-year planning period is 17,170 gallons per day. The projected average daily flow at buildout is 24,750 gpd. Per CDPHE regulations, a new WWTF is sized for maximum month flow conditions. The maximum month flow projection for the 20-year planning period is 21,460 gpd. The maximum month flow projection at buildout is 30,940 gpd. A new facility will be sized for 25,000 gpd to accommodate the 20-year planning period conditions. The projected population, average flow, maximum month flow, peak day flow and peak hour flow for the 20 year planning period and through buildout are summarized in Table 3. This information is provided in detail in Appendix D. The projected 20-year peak daily flow and peak hour flow are 25,760 gpd and 68,680 gpd, respectively. The projected buildout peak daily flow and peak hour flow are 37,130 gpd and 99,000 gpd, respectively.

Table 3: Buildout Population and Flow Projections

Year	Population	Average Daily Flow (gpd)	Max Month Flow (gpd)	Peak Day Flow (gpd)	Peak Hour Flow (gpd)	Average Organic Load (lbs BOD/day)
2013	171	15,390	19,230	23,080	61,537	32.1
2015	173	15,560	19,440	23,340	62,215	32.4
2020	178	16,000	20,000	23,980	63,945	33.3
2025	183	16,440	20,540	24,650	65,723	34.3
2030	188	16,890	21,110	25,340	67,551	35.2
2033	191	17,170	21,460	25,760	68,671	35.8
Buildout	275	24,750	30,938	37,130	99,000	51.6

There are no additional flow reduction measures anticipated outside of the I/I repairs for the collection system. The ongoing I/I repairs are further discussed in Section 3, as requested in the PER checklist (Section 3.4)

WASTELOAD FORECASTS

CURRENT LOADING

Influent wastewater records from 2008 thru 2010 have been used to establish average influent loading characteristics for the WWTF. Historical water quality data is included in Appendix C. From this data, the average influent BOD concentration at the WWTF is 207 mg/L. The maximum and minimum BOD concentrations are 471 mg/L and 92 mg/L respectively. Metcalf & Eddy's *Wastewater Treatment* gives a typical BOD concentration of 250 to 350 mg/L for domestic wastewater. Based on these guidelines, the historical average influent BOD concentration to the WWTF is low for domestic wastewater. As a conservative measure, the WWTF's influent BOD concentration is assumed to be 250 mg/L, the low end of the typical range. As a result, the existing organic loading rate is estimated at 34.2 lbs BOD/day or 0.21 lbs BOD/capita/day at 16,417 gpd. For the purpose of this report, a BOD concentration of 250 mg/L will be used to project future organic loading.

The average influent TSS concentration at the WWTF is 253 mg/L. The maximum and minimum BOD concentrations are 773 mg/L and 99 mg/L, respectively. The existing average TSS concentration of 253 mg/L will be used to project future loading.

The existing WWTF does not monitor influent ammonia concentration. Effluent ammonia concentrations are monitored at the facility and typically average 19.2 mg/L. Metcalf & Eddy's *Wastewater Treatment* gives typical influent total nitrogen as free ammonia concentration of 30 to 45 mg/L for domestic municipal wastewater. For the purpose of this report, free ammonia concentration of 30 mg/L will be used to project future loading. Phosphorus is not currently monitored at the WWTF. A typical approximation for influent phosphorus concentrations, 7 mg/L, will be used for future projections.

The assumed influent concentrations of BOD, total suspended solids (TSS), ammonia (NH₃-N), and phosphorus are summarized in Table 4.

Table 4: Projected Wastewater Characteristics and Loads at 25,000 gpd

Constituent	Estimated Concentration (mg/L)	Estimated Production (lbs/day)	Estimated Production (lbs/capita/day)
BOD ¹	250	52.1	0.27
TSS	253	52.8	0.27
NH ₃ -N ¹	30	6.26	0.03
Total P ¹	7	1.46	0.01

¹Assumed values taken from Metcalf & Eddy, Table 3-15 Typical composition of untreated domestic wastewater

PROJECTED LOADING

The projected organic load for the River Glen HOA WWTF is 52.10 lbs BOD/day based on an influent BOD concentration of 250 mg/L and 25,000 gpd influent flow. The estimated wastewater loading projection are developed assuming 20-year population projection of 191 people. Table 2 summarized the BOD loading through buildout. The influent water quality used for the design of a new WWTF will be 250 mg/L BOD, 253 mg/L TSS, 30 mg/L NH₃-N and 7 mg/L Total P.

SECTION 3 – EXISTING FACILITIES

INTRODUCTION

The existing WWTF was constructed in 1974 and was upgraded in 2005 to incorporate the lift station for the Riverside Farms Subdivision. No upgrades have occurred that would alter the hydraulic or organic capacity of the facility. The WWTF is permitted under CDPHE permit number CO-0029742 and is located on a privately owned 8.19 acre site.

The existing WWTF consists of two lift stations that pump wastewater into one of two aeration lagoons. The aeration cells are above ground lagoons with a combined capacity of 556,000 gallons. The basins are mechanically aerated using two surface aerators. Wastewater flows from the lagoons to a rock filter polishing pond. The effluent is disinfected with sodium hypochlorite and is dechlorinated via a tablet dechlorination system. Treated effluent is surface discharged to the Little Thompson River. The existing WWTF process is shown in Figure 3.

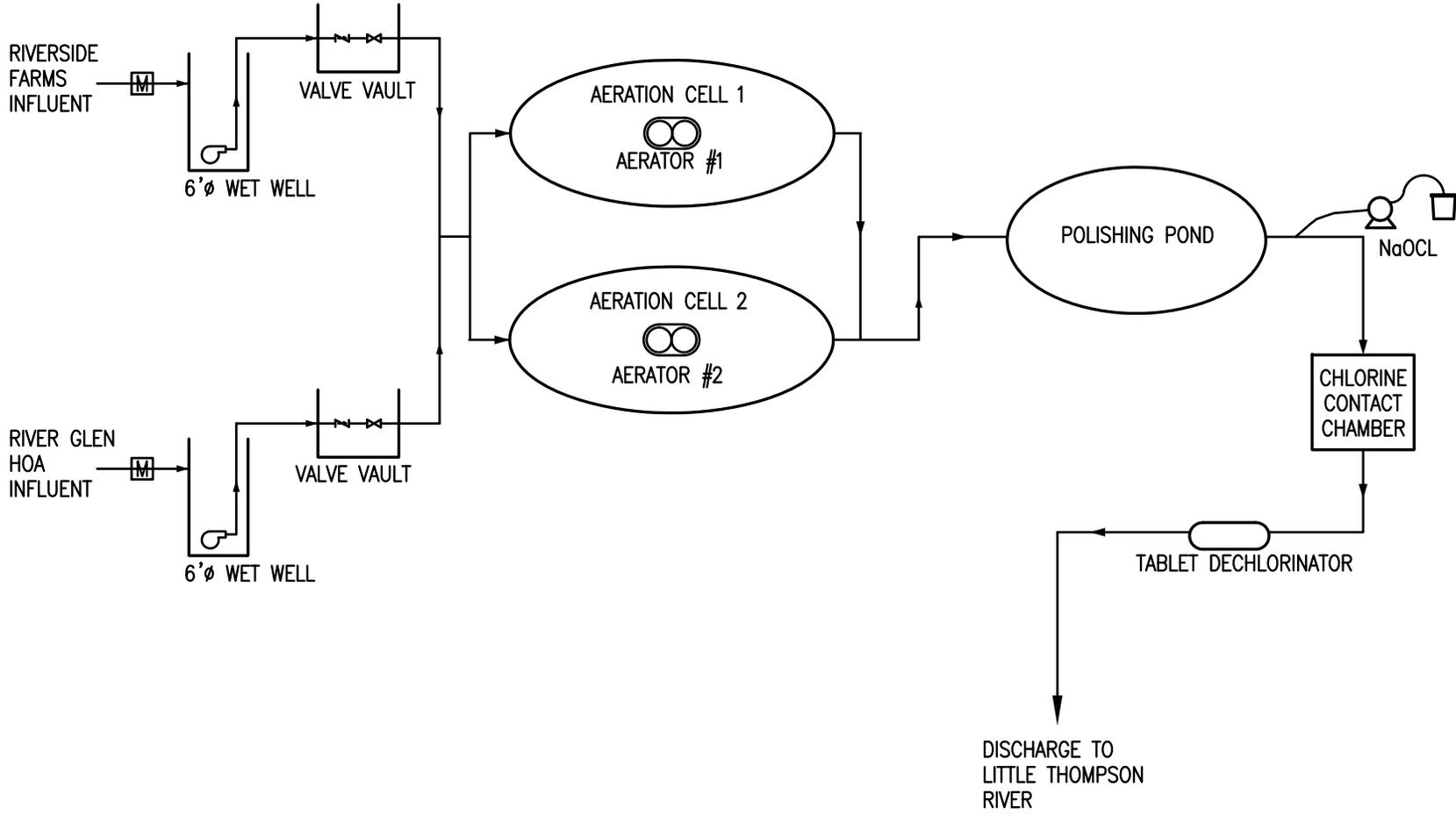
The current hydraulic loading is 16,417 gpd and the organic loading is estimated at 34.2 lbs BOD/day. The design hydraulic capacity of the facility is 0.029 MGD (29,000 gpd) and the organic capacity of the existing WWTF is 52 lbs BOD/day. The discharge permit issued September, 2011 stated that the WWTF will need to reach monthly effluent ammonia limits between 1.7 mg/L and 5.1 mg/L beginning in 2017. The current treatment system has dechlorination capacity; however, the existing effluent ammonia concentration averages 19.2 mg/L.

The above noted discharge permit also introduced a residual chlorine limit beginning in 2017. The new effluent limits for residual chlorine are 0.011 mg/L for the 30-day average and 0.019 mg/L as the daily maximum. The current treatment system does not have the treatment capabilities to meet these requirements, existing effluent chlorine residual concentration averages 0.5 mg/L.

In order to meet the 2017 effluent limits, the River Glen HOA must replace the existing WWTF, or alternatively, coordinate consolidation with the Berthoud WWTP. Based on the historical data, the existing facility is unable to consistently meet ammonia and effluent residual chlorine for the 2017 discharge permit.

SERVICE AREA FEATURES

The service area boundary is 0.5 miles outside the Town of Berthoud's growth boundary. There are no municipal or industrial dischargers within a one mile radius (shown in Figure 4). The Berthoud WWTP is within 2.5 miles from the existing facility, as shown in the five mile radius map (Figure 5). There have been no historical issues with treated effluent from the River Glen



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FIGURE 3 - EXIST PROCESS SCHEMATIC
 RIVER GLEN HOA WWTF
 MAY 2012

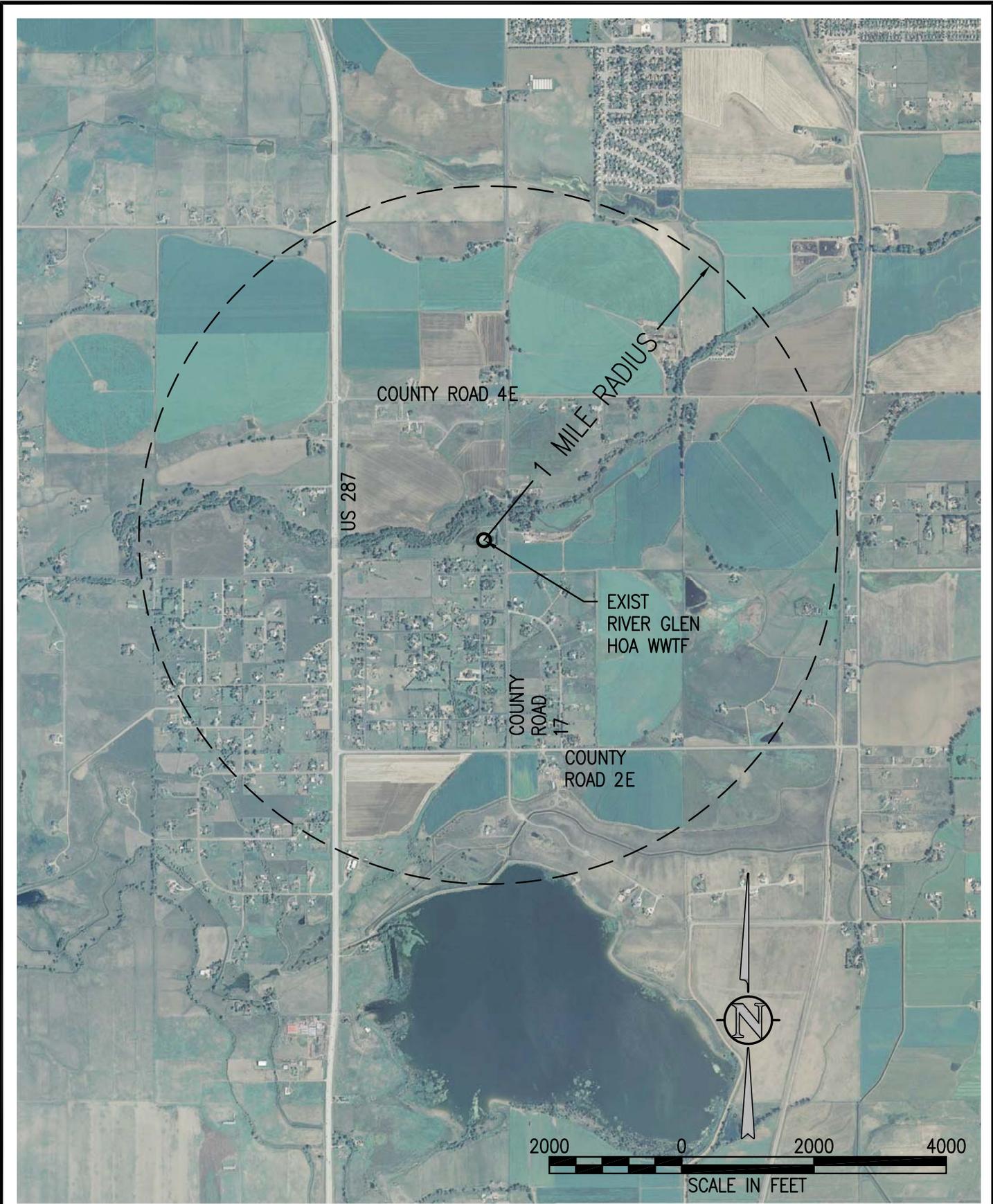


FIGURE 4 - 1 MILE RADIUS
 RIVER GLEN HOA WWTF
 MAY 2012



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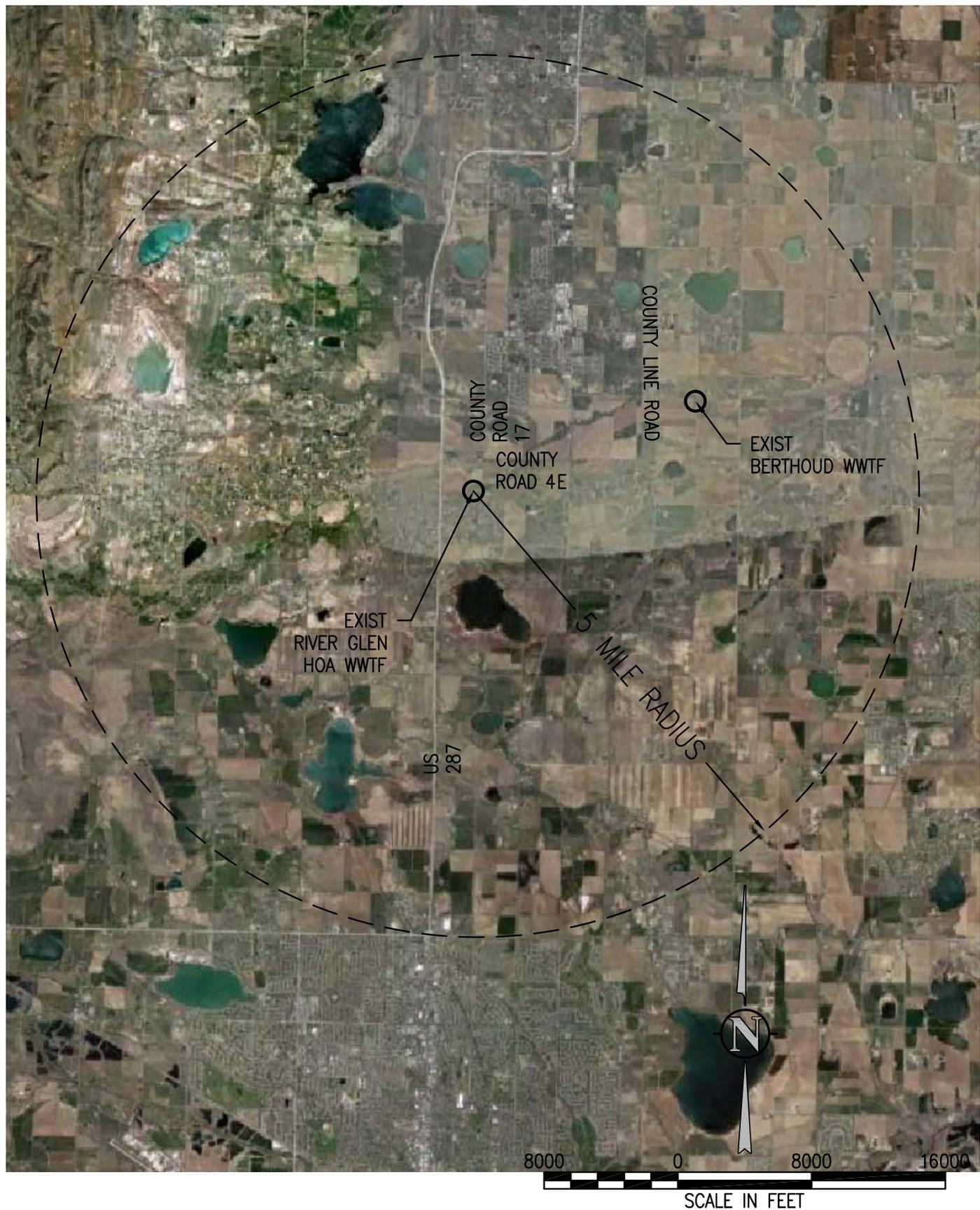


FIGURE 5 - 5 MILE RADIUS
 RIVER GLEN HOA WWTF
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HOA WWTF and there are no plans to accept hauled waste, industrial waste or septage.

The River Glen HOA service area is surrounded by property zoned "farming" per Larimer County. The Larimer County municipal code, allows properties in this category to use onsite septic service. Development of property in this category is restricted to one principal building per lot and a minimum lot size of 2.3 acres per lot if using a well or septic system. It is anticipated that properties west of Highway U.S. 287, east of County Road 17E, and south of County Road 2E are served by onsite systems. Properties north of County Road 4E are within the Berthoud WWTP service area.

AREA DISCHARGE PERMITS

Within a five-mile radius of the River Glen HOA WWTF, the Berthoud WWTP (CO-0046663) is the only other facility that discharges to the Little Thompson River.

The River Glen HOA WWTF discharge permit was issued on September 15, 2011 and is provided in Appendix A. A summary of the discharge limits are provided in Table 5.

Table 5: Colorado Discharge Permit No. CO-0029742

Constituent	30 Day Average	7 Day Average	Daily Maximum
Effluent Flow (MGD)	0.029	--	--
pH (su)	--	--	6.5 – 9
E.coli (#/100mL)	126	252	--
TRC (mg/L) ¹	0.011	--	0.019
NH3 as N, Tot (mg/L) ¹	varies monthly	varies monthly	varies monthly
BOD5, effluent (mg/L)	30	45	--
BOD5, (% removal)	85 (min)	--	--
TSS, effluent (mg/L)	75	110	--
Oil and Grease (mg/L)	--	--	10

¹Beginning January 1, 2017

FACILITIES LAYOUT AND DESCRIPTION

INFLUENT PUMPING STATION

Two influent pump stations transfer gravity sewer to the WWTF. The River Glen HOA pump station consists of a six-foot diameter wet well and a six-foot diameter prefabricated valve vault. The pumping station utilizes two 1.0-hp constant speed submersible pumps capable of pumping 80 gpm at 18 feet of total dynamic head (TDH). The valve vault contains a four-inch discharge line from each pump with a check valve and a gate valve. The two discharge lines are joined into a 4-inch force main that transfer influent to one of the aeration cells. The pump station operates based on the water elevation in the wet well, with a lead pump and lag pump. Influent flow is measured upstream of the pump station by a Palmer Bowlus flume and an electronic level transducer. The River Glen HOA pump station was installed in 1974 and is approaching the end of its useful life. The power supplied to the pump station is single-phase power, to provide more

efficient operation and controls, the pump station will require an upgrade to three-phase power. Additionally, the building does not have any insulation and requires renovation to meet functional requirements. The existing pump station does not include a method for odor control, but there have been little reported concerns.

The Riverside Farms pump station consists of a six-foot diameter wet well and a four-foot diameter prefabricated dry well lift station. The pumping station uses two 3.4-hp constant speed centrifugal pumps capable of pumping 150 gpm at 30 feet TDH. The dry well contains a four-inch discharge line from each pump with a check valve and a gate valve. The two discharge lines are joined into a four-inch force main that transfers wastewater to the WWTF. The pump station operates based on the water elevation in the wet well, with a lead pump and lag pump. The pump station has an influent 8-inch palmer bowlus flume for flow monitoring; however, this equipment is not currently operating. The Riverside Farms pump station was installed in 2005 and has adequate capacity for the buildout flow from the subdivision. The existing pump station does not include a method for odor control.

HEADWORKS

The existing WWTF does not have headworks or screening equipment.

AERATION PROCESS

There are currently two aeration cells, which are both at grade lagoons with a combined volume of 556,000 gallons. Each of the lagoons are sealed with a 12 inch layer of clay material to prevent seepage. Aeration cell one (1) is 70 feet long and 50 feet wide, with a total water volume of 290,476 gallons. Aeration cell two (2) is 50 feet long by 50 feet wide, with a total water volume of 265,529 gallons. The operating water depth of each cell is approximately seven feet and the total depth (to top of berm) is nine feet. Each of the pump stations has the option to discharge to either of the aeration cells. Between the two cells, there is an 8-inch cast iron equalization pipe with a gate valve to isolate each lagoon and provide bypass capabilities. When both cells are in use, the total working volume of the aerated tanks is 556,000 gallons, which provides approximately 21.4 days of hydraulic retention time at the hydraulic design flow. At the existing average flow, 16,417 gpd, the hydraulic retention time for cell one (1) is 17.7 days and 16.2 days in cell two (2), for a total of 33.9 days.

The lagoons are aerated by two identical, 2-hp, floating surface aerators. The aerators have a mixing capacity of 1,700 gpm, with a standard oxygen transfer rate of 5.5 pounds of oxygen. The WWTF does not have return or recycled flow capabilities.

CLARIFICATION

Water from the aeration cells flows to the polishing pond, which has a water volume of 132,033 gallons. The water depth in the polishing pond is six feet, with an eight-foot total depth (to top of berm). The hydraulic retention time in the polishing pond at the system's hydraulic capacity is 4.56 days. At the existing average flow, the hydraulic retention is 8.0 days. The CDPHE Design Criteria specify a polishing pond retention time of between two and five days. The existing pond does not incorporate a sludge removal system. In order to remove sludge, the pond must be

drained. This takes place approximately once every five years, with the last sludge disposal occurring in 2009.

SLUDGE HANDLING

The WWTF does not have the ability to waste settled solids from the lagoons. The River Glen HOA has historically contracted with sludge haulers to vacuum out accumulated solids as needed. There is no sludge handling process or storage facility at the WWTF.

DISINFECTION AND DECHLORINATION

The WWTF utilizes a sodium hypochlorite solution for disinfection, followed by a baffled, 2,000 gallon chlorine contact basin. The sodium hypochlorite dosing pumps are located in a 52 square foot chlorine building. The existing sodium hypochlorite pump is an electronic metering pump with a capacity of 0.13 gph at 300 psi. After chlorination, the treated effluent flows into the chlorine contact basin. Per CDPHE Design Criteria, a minimum of 30 minutes of contact time at peak hour flow is required. At the existing peak hour flow, 65,667 gpd, the chlorine contact basin provides 4.4 minutes of contact time using a baffling factor of 0.1. In order to meet the minimum CDPHE requirements the disinfection system would require modifications.

In 2011, a tablet dechlorination system was installed to reduce the chlorine residual being discharged to the Little Thompson River. Treated effluent is discharged via a gravity 6-inch PVC discharge line at discharge point 001A into the Little Thompson River.

EXISTING WASTEWATER FLOWS

The influent wastewater characteristics for the WWTF are typical for domestic wastewater. The influent and effluent flows were discussed in Section 2 and are provided in detail in Appendix D. The average wastewater flow of 16,417 gpd was estimated using existing influent flow data. The resulting average per capita wastewater flow is 101 gpcd, which consists entirely of municipal wastewater flows. There are no commercial connections within the service area.

The maximum month flow factor was determined to be 1.25 by using typical domestic wastewater peaking factors. Therefore, the maximum month flow is 20,522 gpd. Using existing influent data, the peak day flow factor was determined to be 1.5. The peak day flow calculated using this factor is 23,810 gpd. There is no historical data to calculate the peak hour flow factor. The peak hour factor was assumed based on Metcalf & Eddy's *Wastewater Treatment*, for small service areas the size of the River Glen HOA, to be 4.0. Based on this hourly peaking factor, the peak hour flow is 65,667 gpd.

The influent wastewater flow demonstrates an increase in summer months when compared to the winter influent flow, from approximately 80 gpcd in January to a high of 173 gpcd in July. The collection system is primarily vitrified clay pipe and is over 35 years old; in an evaluation of the collection system video recordings, dated December 28, 2011, the system was discovered to be generally in "good condition with a few locations showing infiltration".

The findings of the evaluation included areas of root infiltration at service connections, infiltration, pipe offsets, and multiple fractures. The significant areas recommended for improvement included

- Repair due to pipe offset – recommended excavation and raising of the offset pipe segment
- Jetting of the collection system to address root intrusion
- 523 feet of the collection system should be repaired to address infiltration issues – recommended replacement or CIPP lining (after jetting)
- 15 feet of the collection system should be repaired to address fractures – recommended excavation of CIPP lining
- 315 linear feet of service connections should be repaired – recommended excavation to replace the service connection

During this evaluation, priorities were also developed for the HOA to create a capital improvements plan. 307 linear feet of the 523 linear feet were highly recommended to be repaired to address the most significant infiltration issues.

The HOA has already conducted the repair recommended to address the pipe offset. Additionally, 731 linear feet of sanitary sewer main is scheduled to be lined using a CIPP process in December of this year (2012). The estimated cost from the contractor is \$23,800. The HOA is intending to continue to budget this amount in their annual O&M budget to continue the recommended collection system improvements.

The impact of these improvement on the per capita flow are currently unknown. However, it was estimated that reduction of 11 gpcd will occur as a result of these efforts. The wastewater flow projections in Section 2 have taken this reduction into account.

FINANCIAL STATUS AND USERS

For 2012, the River Glen HOA users will pay \$200 per quarter for WWTF expenses, or a monthly fee of \$66.67 per connection. The built-out lots in the Riverside Farms development will pay \$150 per quarter, or \$50.00 per month. Undeveloped, platted lots in the Riverside Farms development will pay \$54 per quarter, or \$18.00 per month. These rates are higher than the state average of \$16.42 per month. The River Glen HOA does not have any outstanding debt related to its wastewater system. The current operation and maintenance cost for the collection system and the WWTF is approximately \$30,000 per year, including the contract operator's salary and one-time expense items. See Appendix E for expense and revenue reports from 2009 thru 2011 and a summary of the operation and maintenance costs.

SECTION 4 – PROJECT PURPOSE AND NEED

COMPLIANCE

The River Glen HOA was notified by CDPHE on September 15, 2011 that their next discharge permit (beginning January 2017) will include effluent limits for ammonia and chlorine residual. As discussed in Section 3, the existing WWTF is not capable of meeting the 2017 discharge permit limits. In order to meet these limits, the River Glen HOA will need to replace the existing WWTF or connect to the Berthoud WWTP.

SECURITY

The site of the existing WWTF is fenced and both the influent pumping stations and chlorine building are locked. There have been no security issues to date. The aeration lagoons and polishing ponds are located on private property, which is also fenced.

OPERATION AND MAINTENANCE (O&M)

The existing WWTF was constructed in 1974 and has been repaired and maintained since that time. The operation of the facility has been contracted to Sterkel Operations since 2008. The system has limited redundancy and inadequate controls.

Sterkel Operations continues to operate the WWTF. Their Operator-in-Responsible-Charge (ORC) is a Class C operator, and therefore has the capability to operate the current facility and the proposed wastewater treatment facility or lift stations for the service area.

Operational constraints with the existing WWTF are primarily associated with the lack of adequate controls to properly automate the system.

There are no known concerns associated with water loss at the WWTF. Concerns with the existing collection system have already been discussed at length in Section 3.

GROWTH

The existing WWTF is not adequate due to the technical limitations of the facility and the inability of the facility to meet the 2017 discharge permit limits. The hydraulic capacity of the WWTF is 0.029 MGD. The 20-year projected maximum month wastewater flow is approximately 0.022 MGD (75 percent of hydraulic capacity). The 2012 maximum month wastewater flow is approximated 19,125 gpd which is 66 percent of the hydraulic capacity.

The estimated growth, as discussed in Section 2, is minimal and averages approximately one EQR every three years. The purpose of the proposed project is to provide the HOA with a solution to meet the 2017 discharge permit.

The proposed alternatives will be evaluated for the 20-year planning period and buildout conditions.

SECTION 5 – ALTERNATIVES ASSESSMENT

DESIGN CRITERIA

The four alternatives evaluated to meet the needs of the River Glen HOA included three options to consolidate with the Berthoud WWTP and one alternative to construct a new WWTF. Improvements to the existing WWTF were not considered, as this treatment process is not capable of achieving the required effluent limits. The consolidation alternatives include a combination of new lift stations, modifications to the existing lift station, force mains and gravity sanitary sewer mains. In designing these facilities, the buildout capacity will be used, because the design life of these facilities is longer than the 20-year planning period. In addition, to provide the minimum velocity required by the *State of Colorado Design Criteria for Domestic Wastewater Treatment Works* (WPC-DR-1), 2 ft/s, through a 4-inch diameter force main, the minimum flow possible is 80 gpm, 115,200 gallons per day, or 2.03 ft/s. Sizing pumping facilities for the 20-year planning period result in inadequate flow velocity in the 4-inch diameter force main. Ultimately, this would require replacing the entire force main for the buildout population after the 20-year planning period.

The pumping facilities, per WPC-DR-1, are to be designed for the projected peak hour flow. All of the alternatives that involve pumping facilities will therefore be designed for the buildout peak hour flow, 99,000 gpd.

The alternative to build a new WWTF will also be designed for the buildout conditions in order to equally compare the four alternatives. The WWTF will be designed based on the projected maximum month flow conditions per WPC-DR-1. Costs for buildout design and the 20-year planning period have been calculated. The selection of the alternative will be based on the buildout design cost evaluation, while the 20-year planning period costs have been calculated to satisfy requirements of the PER Checklist. The 20-year planning period costs also did not generate a significant cost savings as compared to the buildout cost projections due to the nature of the alternatives.

The design parameters used in the evaluation of the treatment alternatives are shown in Table 6. All of the proposed alternatives have the capability to address surface discharge effluent limits, which take effect January 1, 2017.

Table 6: Design Parameters

Design Parameter	Value (Influent)	Value (Effluent)
Flow (Maximum Month - Buildout)	31,000 gpd	-
Flow (Peak Hour - Buildout)	99,000 gpd	
Daily Peaking Factor	1.5	-
Maximum Month Peaking Factor	1.25	-
Hourly Peaking Factor	4	-
Organic Loading	73.0 lbs BOD/day	-
BOD	250 mg/L	30 / 45 mg/L (30 day/ 7 day)
TSS	253 mg/L	75 / 110 mg/L (30 day/ 7 day)
NH ₃ *	30 mg/L	Range: 1.7 – 5.1 mg/L
TRC*		0.019 mg/L Daily Max

* Beginning January 1, 2017

DESCRIPTION

In analyzing treatment alternatives for this facility, several characteristics were considered critical to the ultimate selection of the system, including:

- Footprint – The existing facility is located on approximately 8 acres of land. However, the existing WWTF is located within the proposed FEMA 100 year floodplain. Therefore, to minimize the area that has to be elevated, the footprint needs to be minimal.
- Cost – The River Glen HOA is conscious of the cost of this project and does not want to place an unrealistic financial burden on its residents.
- Proven Technology and Ease of Operation – The River Glen HOA wants to ensure that the technology selected is already approved by the State. In addition, the operational aspects of the proposed technology must meet staff capabilities to operate and maintain.

The following four alternatives were considered for further evaluation:

- Alternative 1 – Wastewater Treatment Facility Upgrade (SBR)
- Alternative 2 – Connection at to the Town of Berthoud Dry Creek Interceptor Sewer
- Alternative 3 – Connection at the Berthoud Collection System (east of C.R. 15)
- Alternative 4 – Connection at the Berthoud WWTP

Each of these alternatives is presented in detail below, along with a preliminary opinion of probable cost (OPC).

ALTERNATIVE 1 – WASTEWATER TREATMENT FACILITY UPGRADE (SBR)

Sequencing batch reactors (SBR) are a batch variation of traditional activated sludge processes. SBRs allow for activated sludge biological treatment phases, including aeration and sedimentation, to occur within a single tank. The SBR treatment cycle typically contains five phases; (1) Fill, (2) React, (3) Settle, (4) Decant, and (5) Idle. The “fill” phase consists of the wastewater entering the reactor tank and mixing with the settled biomass from the previous

cycle. The basin may or may not be aerated during the fill phase. The “react” or aeration phase consists of aeration of the reactor basin resulting in organic reduction through biological oxidation and nitrification. In the “settle” or clarification phase the aeration and mixing is stopped to allow the suspended solids to settle. The next phase is “decant” where the treated wastewater is decanted from top of the reactor tank. The final “idle” phase is when the reactor tank is awaiting the start of the next SBR treatment cycle. During the idle phase a portion of the settled solids are removed for digestion and sludge treatment.

The proposed treatment process would include two SBR basins, a post-equalization (EQ) basin, an aerobic digester, influent flow meter, influent mechanical screening, and ultraviolet (UV) disinfection. Each SBR basin contains a surface mixer, diffused aeration and a floating decanter. The post EQ basin will contain two submersible pumps that will pump the effluent to the UV. The aerobic digester will contain diffused aeration. Additionally, a phosphorus filtration system was incorporated in the opinion of probable cost for this alternative, as effluent phosphorus limits are anticipated within the next ten years.

Advantages:

- Small footprint
- SBRs can consistently perform nitrification, denitrification, and phosphorous removal if properly designed and operated
- SBRs have a high operational flexibility and control
- Fully automated process
- HOA maintains wastewater treatment and cost
- Utilize existing site

Disadvantages:

- Hydraulic profile impacts of batch process
- Sludge production requires biosolids handling
- Unknown future discharge requirements
- Increased operator oversight
- More permitting required

The alternative was evaluated for the 20-year planning period and buildout. Costs comparisons between the alternatives were conducted based on the buildout requirements. A summary of the cost analysis for Alternative 1 is provided in Table 7.

Table 7: Alternative 1 – Capital, O&M, and Present Worth (2012 Dollars)

Description	Capital	Annual O&M	20-year O&M	20-year Combined PV
20-Year Planning Period	\$876,100	Varies	\$1,221,000	\$2,097,100
Buildout	\$933,000	Varies	\$1,221,000	\$2,154,000

A detailed breakdown of this estimate is provided in Appendix F. A schematic of this alternative is provided in Figure 6.



FIGURE 6 - ALTERNATIVE #1
 RIVER GLEN HOA WWTF
 MAY 2012



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ALTERNATIVES 2 THRU 4 – CONSOLIDATION

The River Glen HOA is located 0.5 miles from the Town of Berthoud's growth boundary and within a five-mile radius of the Berthoud WWTP. The Berthoud WWTP has sufficient capacity to treat the additional wastewater flows from the River Glen HOA area and has agreed to proceed with a service agreement if one of these alternatives is selected. Each of these alternatives incorporates Berthoud's initial tap fee, \$6,285 per connection (as a capital cost), and the associated monthly service fees (as an O&M cost), which include \$27.06 per month per connection, and an additional \$6.53 per month per 1,000 gallons. The 86 total platted lots will be considered connections per the agreement with Berthoud WWTP regardless of their occupancy status and will be charged the initial tap fee and a \$27.06 monthly base service fee.

ALTERNATIVE 2 – CONNECTION TO THE BERTHOUD WWTP AT THE DRY CREEK INTERCEPTOR SEWER

Alternative 2 connects flows from the River Glen HOA and Riverside Farms collection systems to the Dry Creek Interceptor Sewer. Effluent from the Dry Creek Interceptor Sewer is treated at the Berthoud WWTP. At the point of the Dry Creek Interceptor Sewer where the River Glen HOA flows would contribute, the sanitary sewer main is 21-inch PVC with 7.4 cubic feet per second (cfs) of capacity. This sanitary sewer main and the sanitary sewer mains downstream, have sufficient capacity for the contributing flows from the River Glen HOA service area.

This alternative would include modifications to the existing River Glen HOA lift station, a new force main within County Road 17, a gravity sanitary sewer to the connection point with the Dry Creek Interceptor Sewer, and a new force main addition from the Riverside Farms lift station.

The Berthoud WWTP is considering an agreement where Berthoud would provide the operation and maintenance services of the proposed lift station, force main, and collection system. This cost was included in the O&M costs for this alternative as \$5 per connection per month.

Advantages:

- Decreased obligations associated with operating a wastewater treatment plant
- Reduced operator oversight resulting from the Berthoud WWTP O&M services
- Alignment within existing county right of way

Disadvantages:

- Berthoud WWTP could increase monthly fees

The alternative was evaluated for the 20-year planning period and buildout. A summary of the cost analysis for Alternative 2 is provided in Table 8.

Table 8: Alternative 2 – Capital, O&M, and Present Worth (2012 Dollars)

Description	Capital	Annual O&M	20-year O&M	20-year Combined PV
20-Year Planning Period	\$1,151,700	\$50,100	\$907,000	\$2,058,700
Buildout	\$1,160,500	\$50,100	\$907,000	\$2,067,500

A detailed breakdown of this estimate is provided in Appendix F. A schematic of this alternative is provided in Figure 7.

ALTERNATIVE 3 – CONNECTION TO THE BERTHOUD WWTP AT THE BERTHOUD COLLECTION SYSTEM (C.R. 15)

This alternative connects flows from the River Glen HOA and Riverside Farms collection systems to the Berthoud Collection System. Effluent from the Berthoud Collection System is treated at the Berthoud WWTP. At the point of the Berthoud Collection System where the River Glen HOA flows contribute, the sanitary sewer main is 24-inch PVC with 11.0 cfs of capacity. This sanitary sewer main and the sanitary sewer mains downstream, have sufficient capacity for the contributing flows from the River Glen HOA service area.

For this alternative, effluent collected from the two Subdivisions flows via gravity to a point east of C.R. 15. A lift station would be required to pump wastewater from this location, over the Little Thompson River to the Berthoud Collection System connection point, south of C.R. 6C. This alternative requires modifications to the existing Riverside Farms force main, easement acquisition for the alignment from River Glen HOA to C.R. 15, a new lift station at C.R. 15, and a new force main within C.R. 15 to the connection point with the Berthoud Collection System.

The Berthoud WWTP has agreed to provide the operation and maintenance services of the proposed lift station, force main and collection system. This cost was included in the O&M costs for this alternative as \$5 per connection per month.

Advantages:

- Decreased obligations associated with operating a wastewater treatment plant
- Reduced operator oversight resulting from the Berthoud WWTP O&M services

Disadvantages:

- Berthoud WWTP could increase monthly fees
- Easement acquisition: direct cost to HOA and logistical/legal issues
- Design and construction unknowns

The alternative was evaluated for the 20-year planning period and buildout. A summary of the cost analysis for Alternative 3 is provided in Table 9.

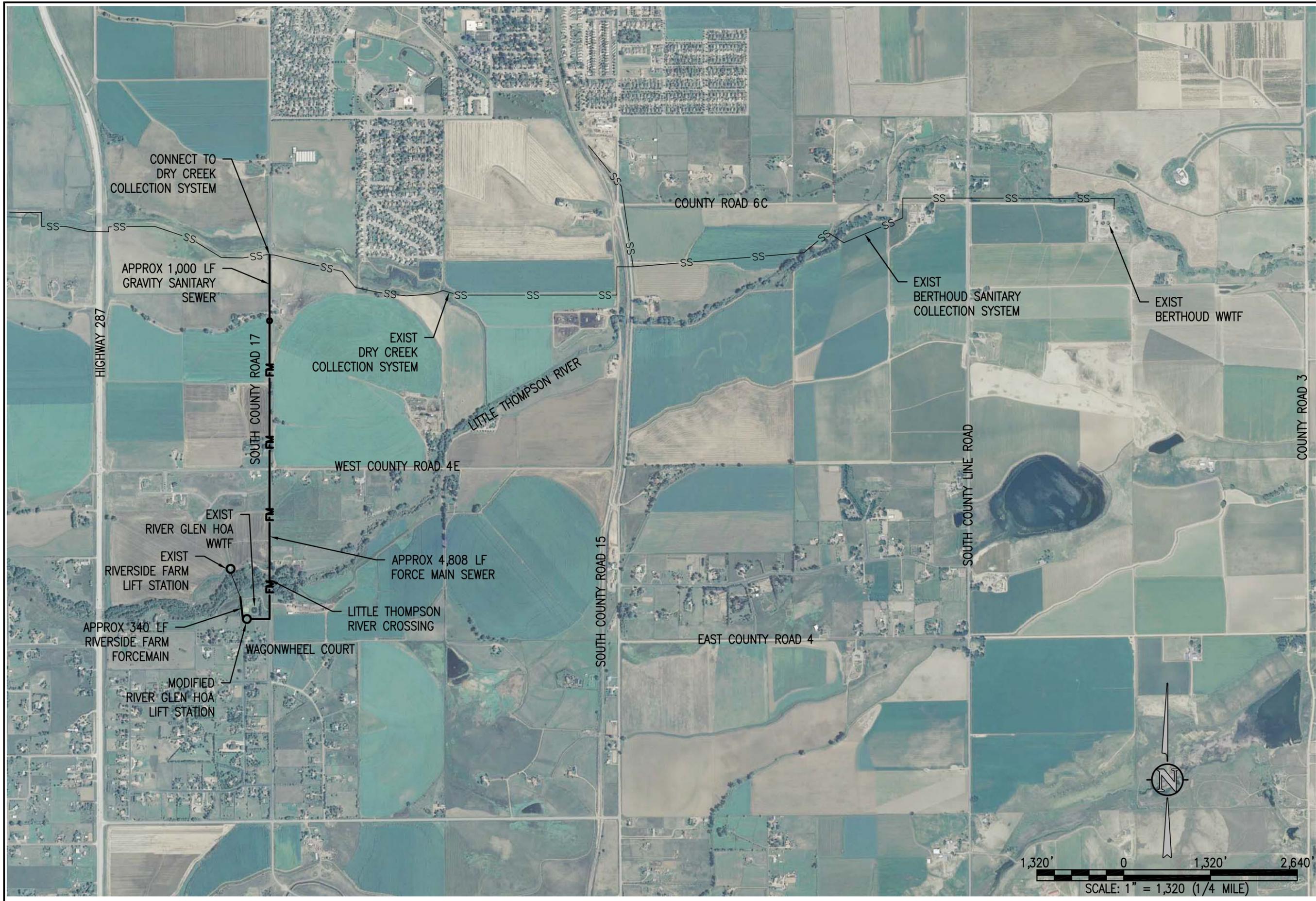


FIGURE 7 - ALTERNATIVE #2
RIVER GLEN HOA WWTF
MAY 2012

Table 9: Alternative 3 – Capital, O&M, and Present Worth (2012 Dollars)

Description	Capital	Annual O&M	20-year O&M	20-year Combined PV
20-Year Planning Period	\$2,598,900	\$50,100	\$907,000	\$3,505,900
Buildout	\$2,607,600	\$50,100	\$907,000	\$3,514,600

A detailed breakdown of this estimate is provided in Appendix F. A schematic of this alternative is provided in Figure 8.

ALTERNATIVE 4 – CONNECTION AT THE BERTHOUD WWTP

For this alternative, effluent collected from the two Subdivisions would flow via gravity directly to the Berthoud WWTP. This alternative requires modifications to the existing Riverside Farms force main, extensive easement acquisition for the alignment from River Glen HOA to the Berthoud WWTP and approximately three miles of sanitary sewer main.

The Berthoud WWTP has agreed to provide the operation and maintenance services of the proposed collection system. This cost was included in the O&M costs for this alternative as \$5 per connection per month.

Advantages:

- Decreased obligations associated with operating a wastewater treatment plant
- No lift station operation
- Minimal operator oversight
- Decommission entire existing WWTF site

Disadvantages:

- Berthoud WWTP could increase monthly fees
- Easement acquisition: direct cost to HOA and logistical/legal issues
- Design and construction unknowns

The alternative was evaluated for the 20-year planning period and buildout. A summary of the cost analysis for Alternative 4 is provided in Table 10.

Table 10: Alternative 4 – Capital, O&M, and Present Worth (2012 Dollars)

Description	Capital	Annual O&M	20-year O&M	20-year Combined PV
20-Year Planning Period	\$2,067,700	\$50,100	\$907,000	
Buildout	\$2,067,700	\$50,100	\$907,000	\$2,974,700

A detailed breakdown of this estimate is provided in Appendix F. A schematic of this alternative is provided in Figure 9.



FIGURE 8 - ALTERNATIVE #3
 RIVER GLEN HOA WWTF
 MAY 2012



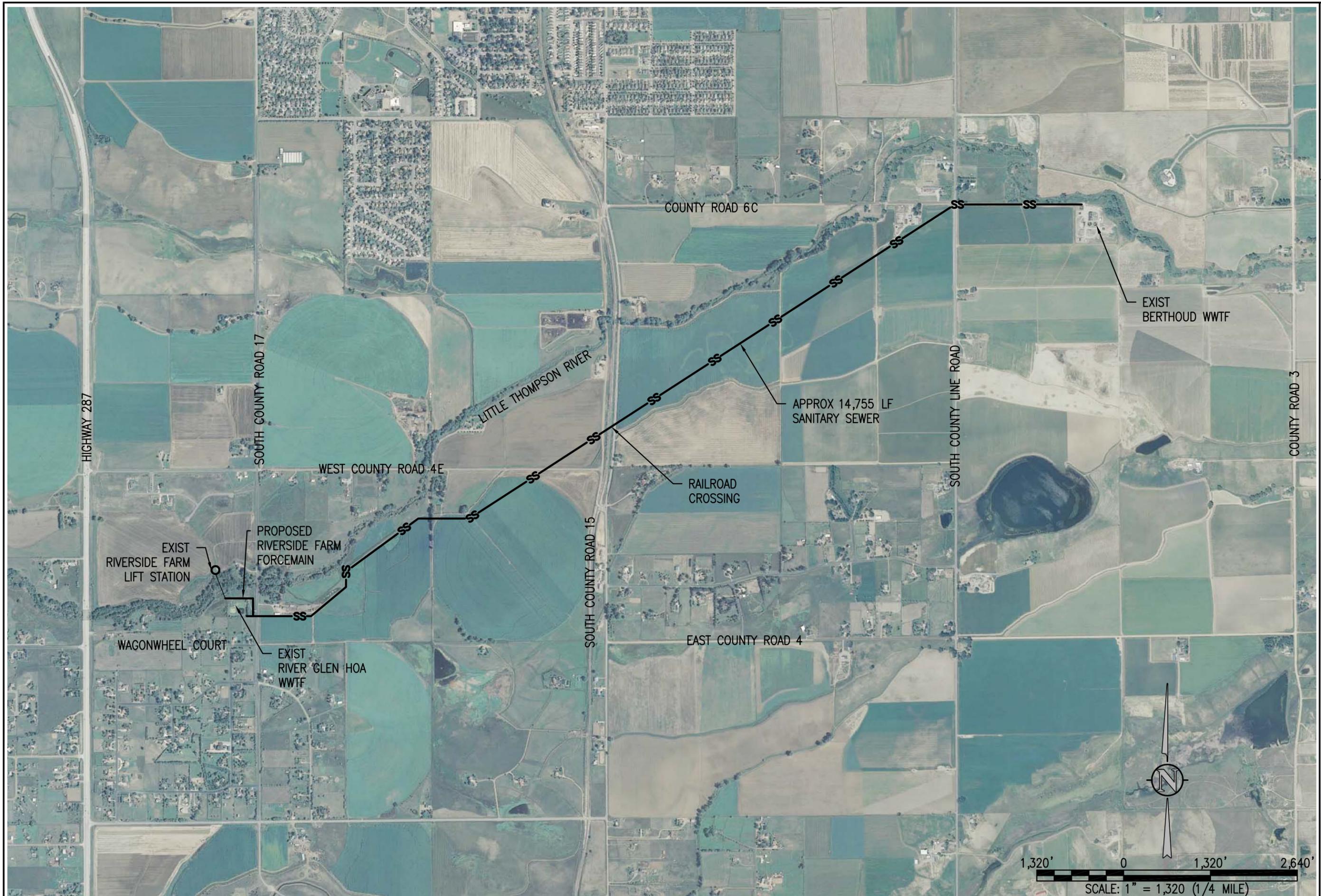


FIGURE 9 - ALTERNATIVE #4
 RIVER GLEN HOA WWTF
 MAY 2012

ENVIRONMENTAL IMPACTS

There are no known areas of archaeological significance, along the alignment of the proposed alignments or at the WWTF site. Erosion control measures will be developed for all of the proposed alternatives to minimize impacts during construction.

ALTERNATIVE 1

The existing WWTF site, and location of Alternative 1, is not located within a designated wetland. Therefore, a 404 Permit is not anticipated for the construction of this alternative. If a 404 Permit is determined necessary during the design phase, it will be pursued at that time. The floodplain along the Little Thompson River has the potential to add complexity to the construction of a new WWTF. Construction of a new WWTF in this location will require proper planning to ensure the appropriate surface elevation is met to keep the facilities above the flood elevation.

There are no known wildlife habitats that will be impacted by the construction of a new WWTF on the existing facility.

ALTERNATIVE 2

The alignment for Alternative 2 includes a crossing of the Little Thompson River. This construction will be done by boring the proposed force main under the Little Thompson River. Permits associated with the river crossing will be investigated during the design phase; however, this is not anticipated at this time. To minimize any impact associated with this construction, this portion of the project will occur during the winter months during periods of low flow.

Based on the National Wetlands Inventory Map, there are no wetlands associated with this region of the Little Thompson River and therefore, a 404 Permit is not anticipated. If a 404 Permit is determined necessary during the design phase, it will be pursued at that time.

The floodplain along the Little Thompson River has the potential to add complexity to the construction of this force main and the proposed lift station modifications. Lift station modifications at the existing WWTF site will require proper planning to ensure the appropriate surface elevation is met to keep the facilities above the flood elevation. As noted above, the construction of the force main crossing will occur during the winter months during low flow conditions to mitigate floodplain concerns associated with the construction.

There are no known wildlife habitats that will be impacted by the construction of the proposed lift station and force main.

ALTERNATIVE 3

The alignment for Alternative 3 includes a crossing of the Little Thompson River. This construction will be done by boring the proposed force main under the Little Thompson River. Permits associated with the river crossing will be investigated during the design phase; however,

this is not anticipated at this time. To minimize any impact associated with this construction, this portion of the project will occur during the winter months during periods of low flow.

Based on the National Wetlands Inventory Map, there are no wetlands associated with this region of the Little Thompson River and therefore, a 404 Permit is not anticipated. If a 404 Permit is determined necessary during the design phase, it will be pursued at that time. The majority of the alignment is along private, active, farmland and is therefore not anticipated to require wetlands mitigation.

The floodplain along the Little Thompson River has the potential to add complexity to the construction of this force main, gravity sanitary sewer main, and the proposed lift station modifications. Lift station modifications at the existing WWTF site will require proper planning to ensure the appropriate surface elevation is met to keep the facilities above the flood elevation. As noted above, the construction of the sanitary sewer main crossing will occur during the winter months during low flow conditions to mitigate floodplain concerns associated with the construction.

There are no known wildlife habitats that will be impacted by the construction of the proposed lift station and force main.

ALTERNATIVE 4

The alignment for Alternative 4 is the only alternative which does not include a crossing of the Little Thompson River. Furthermore, the majority of this alignment is along private farmland and is the furthest distance from the Little Thompson River floodplain boundaries.

Based on the National Wetlands Inventory Map, there are no wetlands associated with the region that is in the closest proximity to the Little Thompson River; therefore, a 404 Permit is not anticipated. If a 404 Permit is determined necessary during the design phase, it will be pursued at that time. The majority of the alignment is along private, active, farmland and is therefore not anticipated to require wetlands mitigation.

The floodplain along the Little Thompson River has the potential to add complexity to the construction of the force main and the proposed lift station modifications. Lift station modifications at the existing WWTF site will require proper planning to ensure the appropriate surface elevation is met to keep the facilities above the flood elevation. As noted above, the construction of the sanitary sewer main crossing will occur during the winter months during low flow conditions to mitigate floodplain concerns associated with the construction.

There are no known wildlife habitats that will be impacted by the construction of the proposed lift station and force main.

LAND REQUIREMENTS

The River Glen HOA owns the property where the existing WWTF is located. Replacement of the facility would occur on the same property. As such, Alternative 1 has no complications pertaining to land requirements. Alternative 2 would have a lift station on the existing property

and a force main in County right-of-way along within County Road 17. For Alternatives 3 and 4, significant easement acquisition would be required.

CONSTRUCTION PROBLEMS

The existing WWTF is located within the newly proposed FEMA floodplain. As a result, construction of a new WWTF in this location will require proper planning to ensure the appropriate surface elevation is met to keep the facilities above the flood elevation. Alternatives 2 thru 4 will require river and railroad crossings, which add complexity to the construction phase. Furthermore, subsurface conditions along the alignments of Alternatives 3 and 4 are unknown and have the potential to increase complexity. These two alternatives will also require coordination with landowners for easement acquisition and access to the site during construction. For each of the alternatives the existing WWTF will remain in service throughout construction and will be decommissioned once the system is completed.

OPERATIONAL ASPECTS

The River Glen HOA currently contracts Sterkel Operations, LLC to operate the WWTF. It is anticipated that the existing staff will continue to operate and maintain the proposed facility if Alternative 1 is selected. The operator in responsible charge (ORC) has a Class C license for wastewater treatment. The proposed wastewater treatment facility upgrade alternative will require a Class C wastewater license, and the consolidation options will require a Class 1 Collection System License for the lift stations.

Berthoud WWTP is considering an agreement to provide all operations and maintenance services for each of the consolidation alternatives. In this instance the River Glen HOA will still own the collection system, force main, lift station, etc. but the operations would be contracted the Town of Berthoud WWTP. A service agreement between the River Glen HOA and the Berthoud WWTP will be required if Alternative 2 thru Alternative 4 are selected. Preliminary discussions have established a monthly charge for the O&M service above \$5.00 per connection.

COST ESTIMATES

Detailed cost estimates for the 20-year planning period and buildout for each alternative can be found in Appendix F. The combined capital cost and 20-year O&M cost projections for each alternative for the buildout design condition are summarized in Table 11. The present worth O&M costs have been determined through an analysis of each process and include system requirements such as energy requirements, chemical costs, and sludge hauling costs.

Table 11: Summary of Capital, O&M, and Present Worth (2012 Dollars) – Buildout Design

Alternatives					
Item	Description	Alternative 1 SBR	Alternative 2 Dry Creek	Alternative 3 C.R. 15	Alternative 4 B. WWTP
1	Capital	\$933,00	\$1,160,500	\$2,607,600	\$2,067,700
2	20 Year O&M Cost	\$1,221,000	\$907,000	\$907,000	\$907,000
3	Life Cycle Cost	\$2,154,000	\$2,067,500	\$3,514,600	\$2,976,700

ADVANTAGES & DISADVANTAGES

A description of the advantages and disadvantages for each alternative are listed following the discussion of the alternative.

SECTION 6 – SELECTED ALTERNATIVE

JUSTIFICATION OF SELECTED ALTERNATIVE

Each treatment alternative was ranked on a scale of 1 to 4 using the following criteria: capital cost, operations and maintenance costs, life cycle costs, reliability and regulatory compliance, environmental impact, site and easement requirements, and ease of operations. A value of 1 represents the least favorable and 4 the most favorable. The rating was multiplied by the importance factor, which is a measurement of the significance of each criteria to the River Glen HOA. Table 12 presents the alternatives comparison matrix, with the highest total score indicating the most favorable alternative.

Table 12: Alternatives Analysis Decision Matrix

Comparison Criteria	Importance Factor	SBR		Dry Creek Connection		CR 15 Connection		B.WWTP Connection	
		Rank	Score	Rank	Score	Rank	Score	Rank	Score
Capital Cost	3	4	12	3	9	1	3	2	6
O&M Costs	3	3	9	4	12	4	12	4	12
Life Cycle Cost	3	3	9	4	12	1	3	2	6
Reliability / Regulatory Compliance	2	1	2	3	6	2	4	4	8
Environmental Impact	2	1	2	4	8	2	4	3	6
Site and Easement Requirements	2	4	8	3	6	2	4	1	2
Operator Attention/Licensing Requirements	1	1	1	3	3	2	2	4	4
TOTAL			43		56		32		44

Beyond the cost evaluation for each treatment alternative, other criteria were considered during the evaluation process. The operational complexity and attention required for each alternative was considered as an annual cost value. The reliability and regulatory compliance gauged the level of confidence that the alternative could meet the effluent limitations and future regulatory requirements. The environmental impact criteria assessed the visual impact and odor potential for each alternative. Finally, the space requirements of each alternative were considered, as well as the acquisition of easements for force main or gravity sanitary sewer main alignments.

Based on the above matrix, it was determined that a modified River Glen HOA lift station and force main/gravity line to the Dry Creek Interceptor Sewer would meet the River Glen HOA's current and future needs, and relieve the HOA of the responsibility associated with operating a WWTF. Although this alternative has a slightly higher capital cost, the reduced operation and maintenance costs, as well as the long term life cycle cost make this option the recommended alternative.

TECHNICAL DESCRIPTION

The lift station modifications will be designed to comply with the requirements specified in Chapter 4 of the WPC-DR-1 criteria for Lift Stations. The major features of the selected alternative include: 1) Upgraded lift station equipment and automated flow measurement, 2) approximately 5,150 linear feet of 4-inch ductile iron force main, 3) approximately 1,000 linear feet of 8-inch PVC gravity sanitary sewer main, 4) site upgrade to three-phase power and 5) proposed pumping capacity of 80 gpm from the modified lift station. The recommended alternative schematic was presented in Figure 7. A process schematic of the proposed alternative is provided in Figure 10.

As discussed in Section 5, the proposed lift station will be designed for the buildout peak hour pumping capacity (as required by CDPHE for pumping systems) during the buildout conditions, 99,000 gpd. The 80 gpm pumping capacity of the lift station was selected to provide a minimum velocity of 2 ft/s. At the point of the Dry Creek Interceptor Sewer where the River Glen HOA flows would contribute, the sanitary sewer main is 21-inch PVC with 7.4 cubic feet per second (cfs) of capacity. This sanitary sewer main and the sanitary sewer mains downstream, have sufficient capacity for the contributing flows from the River Glen HOA service area. The Berthoud WWTP capacity is 2.0 MGD and their current annual average flows are 0.6 MGD. Both the interceptor and the WWTP have sufficient capacity to accept the additional flow from the River Glen HOA.

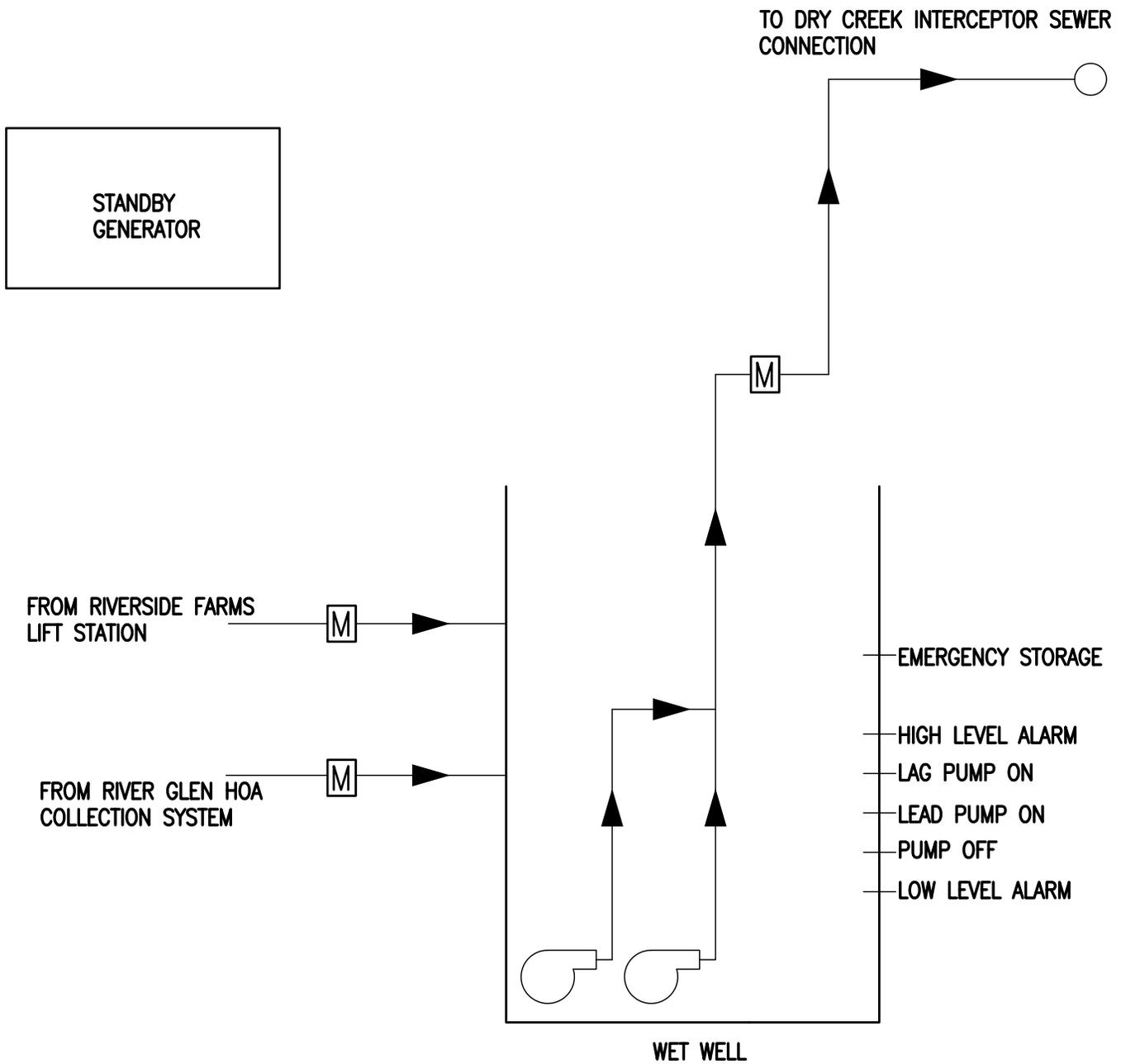
The proposed lift station modifications must address stand-by power requirements in case of an emergency, as required by WPC-DR-1, Section 4.1.0.f. Emergency overflow storage will be provided at the existing WWTF site and will be sized provide sufficient volume for emergency response to restore power or replace equipment in the event of an emergency. Preliminary calculations anticipate a six hour response time and average buildout flow conditions will require 6,200 gallons of overflow storage. The final design of emergency overflow storage will be developed during the design phase after an agreement is reached with the Berthoud WWTP regarding the O&M responsibilities of the proposed facilities. Additional flood proofing precautions will be required for all emergency overflow storage facilities and will be taken into account during the design phase of these facilities.

Additionally, flood-proofing requirements will be addressed by extending the top of wet well elevation 18 inches above the flood elevation as required and a flood proofing plan (if necessary) will be developed during the design phase.

The operation of the lift station and associated force main will be the responsibility of the Berthoud WWTP. The Berthoud WWTP has agreed to the O&M of the lift station and force main for a monthly fee of approximately \$5.00 per connection. Due to the size of the lift station and the requirements for lift station operation, a full time onsite operator is not required. Remote access and dial-out alarms will help facilitate remote or intermittent operations.

ENVIRONMENTAL REVIEW OF SELECTED ALTERNATIVE

The WQCD will determine if the project is categorically excluded from an Environmental Assessment upon receipt of this report.



**FIGURE 10 -SELECTED ALTERNATIVE
PROCESS SCHEMATIC**
RIVER GLEN HOA WWTF PER
MAY 2012



JVA, Incorporated
1319 Spruce Street
Boulder, CO 80302
Phone: 303.444.1951
Fax: 303.444.1957
E-mail: info@jvajva.com

GREEN PROJECT RESERVE

This project is not eligible for Colorado State Revolving Fund funding because the River Glen HOA does not meet the "governmental agency" requirement. Since Green Project Reserve projects must be eligible for Colorado Water State Revolving Fund funding, this project is also not Green Project Reserve eligible.

COSTS

The cost estimate for the buildout design condition is provided in Table 13. The cost savings for designing for the 20-year planning period, as opposed to the buildout condition is minimal and is seen reflected in the cost of smaller pumping equipment. Estimated capital cost saving for designing for the 20-year planning period as opposed to the buildout condition is \$10,000. The O&M costs difference between the two OPCs is negligible.

The agreement with the Berthoud WWTF requires that tap fees be paid for all platted lots. There are currently 86 platted lots between the two subdivisions, the tap fees for the 86 lots have been included as part of this cost estimate. In addition to the tap fees, the Berthoud WWTF requires a monthly \$27.06 base fee per connection. This fee will be applied to the 86 platted lots regardless of their occupancy status, this has been accounted for in the projected O&M costs associated with the selected alternative. In addition to the detailed cost breakdown of the selected alternative, for the 20-year planning period and the buildout condition are provided in Appendix F. A summary of the estimated project cost is provided in Table 13.

Table 13: Summary of the Opinion of Probable Cost for Alternative 2

Description	Installed Cost
Division 02 – General Sitework	\$215,700
Division 03 – Concrete	\$32,000
Division 11 – Equipment	\$80,000
Division 16 – Electrical and Controls	\$43,000
Miscellaneous – Bore	\$20,000
Subtotal	\$390,700
Contingency (20%)	\$78,100
Contractors OH&P (15%)	\$70,300
Permitting, Design and Construction Administration (15%)	\$80,900
Construction Capital Total	\$620,000
Berthoud WWTP Tap Fee	\$540,500
PROJECT TOTAL	\$1,160,500

CURRENT AND PROJECTED USER RATES

For 2012, the River Glen HOA customers will pay \$200 per quarter for WWTF expenses. The built-out lots in the Riverside Farms development will pay \$150 per quarter and \$54 per quarter for undeveloped platted lots. The projected user rates will increase an average of \$51.00 per month, which includes the base user fee for the Berthoud WWTF and the estimated use charge

for the WWTP. The loan repayment rate will be revised once the loan terms have been finalized. Based on the current fee structure and the preliminary annual O&M expenses, a 20-year cash flow projection was developed and is included in Appendix E.

PROJECT IMPLEMENTATION

The River Glen HOA was issued a compliance schedule by CDPHE on September 15, 2011. The dates and progress of the items outlined in the compliance schedule are provided in Table 14. Those items required by the compliance schedule have the required completion date noted in the "Due Date" column. Additional milestones are included in this implementation schedule to comply with the PER Checklist Guidelines, these items do not list a "Due Date".

Table 14: CDPHE Compliance Schedule

Event	Due Date	Status
Hire a Consultant/Professional Engineer	March 2012	Complete
Plan, Report, or Scope of Project	December 2012	In Progress
Application for SRF Funding Submitted		December 2012
Environmental Assessment		January 2013
Site Application Amendment	-	February 2013
Engineering Plan/Design Documents	June 2013	May 2013
SRF Funds Available		May 2013
Bid Construction Project		August 2013
Commence Required Work or On-Site Construction	June 2014	September 2013
Status/Progress Report	June 2015	
Status Progress Report	June 2015	
Complete Required Work or On-Site Construction	December 2016	January 2013

A public meeting regarding the four alternatives was held on February 23, 2012. During this meeting, the River Glen HOA conducted an informal vote where Alternative 2 was identified as the preferred alternative.

A second public meeting with the required 30-day notice period occurred scheduled for June 21, 2012. A legal notice will be printed in the Berthoud and Loveland newspapers 30 days prior to the public meeting. A summary of the results of the public meeting will be submitted as they become available.

It is anticipated that this project will be submitted to CDPHE for site approval in February 2013. CDPHE approval is anticipated by May 2013. The River Glen HOA anticipates submitting design documents by the end of May 2013. With bidding in August, it is anticipated that construction will commence in September 2013 and will require three (3) months, making the modified lift station and force main operational by early 2014.

No discharge permit will be required for the selected alternative. A stormwater discharge permit will be further investigated during the design phase of this project and will be applied for it appropriate. A General Nationwide 401 and 404 Permit for the stream crossing will be investigated for this project during the design phase; however, based on the NWI map, which

indicated that there are no designated wetlands at this crossing location, this permit is not anticipated.

For the implementation of the recommended alternative, agreements will be required between Berthoud and the River Glen HOA. A Memorandum of Understanding (MOU) with Berthoud will address the operation and maintenance of the lift station, tap fees, and monthly service charges. In addition, the existing IGA between Riverside Farms and the River Glen HOA will be modified to address the change in wastewater treatment location.

PRELIMINARY EFFLUENT LIMITS

PELs are not required for the recommended alternative.

APPENDIX A-CDPHE FORMS

1. PER Checklist
2. CDPHE Discharge Permit

Wastewater Preliminary Engineering Report Guidance & Review Checklist Form

Name of Project: River Glen HOA Wastewater Treatment Facility

Applicant Name: River Glen Homeowners Association (303) 478-6904
 Address: P.O. Box 1251
 Berthoud, CO 80513

Consultant Name: JVA, Inc (303) 444-1951
 Address: 1319 Spruce Street
 Boulder, CO 80302

Type of Project: Wastewater Treatment

WQCD District Engineer:
 WQCD Project Manager:

Section (Suggested Outline)	Necessary Elements (Guidance)	Addressed on Page (Applicant)	Complete (Reviewer)
(1) Executive Summary	Briefly summarize the system needs, selected alternative, overall costs, and environmental benefits of the proposed project.		
		Page 1	

(2) Planning Conditions	This section should contain an overview of the significant regional features defining the context of the report and proposed project. Displaying much of the information in map and tabular formats is highly recommended for ease of review and discussion.		
(2.1) Planning Area	Include map(s) of the current and projected service area for the 20-year planning period; identify environmental features such as streams, lakes, wetlands, and floodplains for the <u>entire</u> planning area. <i>This documentation does not require field surveys and may be obtained from existing data sources such as the National Wetlands Inventory, FEMA and USGS.</i>	Page 2, 4 Figure 1 & Figure 2 Appendix B	
(2.2) 208 Plan Coordination	If the proposed project is within the boundaries of a 208 Agency or regional council of governments (COG), address conformance with the 208 Plan in relation to service area boundaries, population projections, and whether or not the project is identified in the 208 Plan.	Page 4	
(2.3) Growth Areas and Population Trends	Summarize population projections for the project planning area for a 20-year planning period; compute and compare recent growth rates with projected growth rates; compute estimated increases in equivalent residential units (EQRs);	Page 4, 6	

Section (Suggested Outline)	Necessary Elements (Guidance)	Addressed on Page (Applicant)	Complete (Reviewer)
	identify growth boundaries and specific areas of concentrated growth; and reference information sources.		
(2.4) Wastewater Flow Forecasts	Briefly summarize current flows and projections (average day, peak day, and peak hour) for the project planning area for a 20-year period; infiltration and inflow impacts; and flow reduction measures such as water conservation practices.	Page 6-8	
(2.5) Wasteload Forecasts	Identify wasteload projections for major effluent parameters such as BOD, TSS, ammonia, phosphorus, metals, etc.	Page 8-9	

(3) Description of Existing Facilities	This section should provide a description of the existing treatment and collection facilities.		
(3.1) Service Area Features	On the planning area map, identify the locations of municipal and industrial treatment plants, sludge management areas and facilities, pretreatment plants, pumping sites and any significantly developed areas served by onsite or unconventional systems.	Page 13, Figure 4 & Figure 5	
(3.2) Area Discharge Permits	Identify all other discharge permits for facilities discharging to the same stream segment as the existing treatment facilities.	Page 14	
(3.3) Facilities Layout and Description	Provide a schematic layout and describe existing facilities including design capabilities and condition of existing treatment processes. Highlight dates major system components were constructed and remaining useful life.	Figure 3, Page 14-16	
(3.4) Wastewater Flows	Describe the existing wastewater flows/influent characteristics (including toxic pollutants), discharge permits, and overload conditions. Identify any combined sewer systems, locations of bypasses and overflows. Discuss and analyze the average, peak, dry, and wet weather flows. Provide information on current infiltration and inflow as well as flow reduction impacts.	Page 16-17	
(3.5) Financial Status and Users	Discuss the financial status of the current wastewater system including O & M costs, existing debt, rate structure and other capital improvement programs. Also include a tabulation of volumes used by types of users (e.g., residential, commercial, industrial) for the most recent typical fiscal year.	Page 17	

(4) Project Purpose and Need	This section should document the <u>applicable</u> reasons for considering modifications to the existing facilities.		
(4.1) Compliance	Include a discussion of the system's current and future discharge permit compliance status.	Page 18	

Section (Suggested Outline)	Necessary Elements (Guidance)	Addressed on Page (Applicant)	Complete (Reviewer)
(4.2) Security	Identify any vulnerability assessment concerns..	Page 18	
(4.3) Operation and Maintenance (O&M)	Identify O&M issues such as operational constraints, water loss and adequate controls.	Page 18	
(4.4) Growth	Identify growth related needs such as approaching 80% of design capacity and expanding for proposed future growth; considerations for phasing capacity increases and consolidating systems. Provide reasons for projected future growth during the planning period; identify support by additional revenues and local and regional planning.	Page 18-19	

(5) Assessment of Alternatives	This section should contain a description of the reasonable alternatives (no action, building new centralized facilities, optimizing the current facilities, interconnecting with other existing facilities, and developing centrally managed small cluster or individual facilities) that were considered in planning a solution to meet the identified needs. Consolidation of treatment facilities should be evaluated in accordance with WQCD Policy on Consolidation of Domestic Wastewater Treatment Works. The alternatives should be consistent with those considered in the environmental review. Mitigation measures necessary to avoid or minimize any adverse environmental effects must be integrated into the project design. <u>Complete assessments should be grouped by alternative and should include information requested in (5.1) through (5.8) below:</u>		
(5.1) Description	Describe and compare all feasible wastewater treatment technologies including new technologies that have been thoroughly tested and installed or piloted with successful operating and compliance track records, and the facilities including collection facilities (systems and alignments, including infiltration and inflow aspects) associated with each alternative.	Page 21-28	
(5.2) Design Criteria	State the design parameters, including effluent limitations, used for evaluation purposes of each alternative. The parameters must comply with state regulatory requirements and the State of Colorado's Design Criteria Considered in the Review of Wastewater Treatment Facilities (Ref. WQCD Policy 96-1).	Page 20	
(5.3) Environmental Impacts	Describe direct and indirect impacts <u>unique</u> to each alternative on floodplains, wetlands, wildlife habitat, historical and archaeological properties, etc., including any projected permits and certifications.	Page 30-31	
(5.4) Land Requirements	Identify sites and easements, as well as permits and certifications required for each alternative, and specify if the properties are currently owned, to be acquired or leased by the applicant.	Page 31	
(5.5) Construction Problems	Discuss concerns such as subsurface rock, high water table, limited access, or other conditions that may affect cost of construction or operation of a facility for each alternative.	Page 32	

Section (Suggested Outline)	Necessary Elements (Guidance)	Addressed on Page (Applicant)	Complete (Reviewer)
(5.6) Operational Aspects	Discuss, in general terms, the staffing requirements, certification level requirements, and the expected basic operating configuration and process control complexities for each alternative.	Page 32	
(5.7) Cost Estimates	Provide cost estimates for each alternative including breakdowns for construction, non-construction, and annual operations and maintenance, as well as a present worth analysis for each alternative. A reasonable discount rate should be used for determining the present worth of the uniform series of O&M values (in today's dollars) and the salvage value.	Page 22, 25, 27, 32 & Appendix F	
(5.8) Advantages/ Disadvantages	Describe, in a narrative format, how each alternative affects the applicant's current and future needs with respect to financial, managerial, and operational resources; how each alternative complies with regulatory requirements and existing comprehensive area-wide development plans; and how each alternative satisfies public and environmental concerns. Summarize, in a matrix rating system, the advantage and disadvantages of each alternative for clarity.	Page 22, 24-25, 27	

(6) Selected Alternative	This section should contain the description of the chosen alternative. Include basic hydraulic profiles, basin sizes, detention times, etc. The Water Quality Control Division considers this as a 10% design submittal.		
(6.1) Justification of Selected Alternative	Demonstrate the recommended alternative is the most favorable based on monetary and non-monetary considerations covered in section 5 above. Address whether or not the technology is addressed in the state design criteria. Typically, any new technology or technologies not yet used in Colorado require a submission to the Technical Services Unit (TSU) for the New Technologies Committee.	Page 34	
(6.2) Technical Description	Describe the major features - treatment plant, collection lines, and lift stations; schematic flow diagram; unit processes and sizes; sewer length and sizes; preliminary effluent limits; design criteria – detention times, overflow rates, process loadings, removal efficiencies, initial design flow, reserve capacity, adequate collection system capacity (existing and proposed); pre-treatment needs; flood proofing requirements; final bio-solids disposal options and costs; and cost saving/pollution prevention measures such as energy conservation and sale of biosolids.	Page 35 & Figure 10	
(6.3) Environmental Review of Selected Alternative	To facilitate the environmental determination process, we require the Environmental Assessment Checklist be completed for the selected alternative and included as an appendix to the PER. This document can be found on the CDPHE WQCD FSU website : http://www.cdph.state.co.us/wq/Grantsandloansunit/index .	Page 35	

Section (Suggested Outline)	Necessary Elements (Guidance)	Addressed on Page (Applicant)	Complete (Reviewer)
	html		
(6.4) Green Project Reserve	Describe any green components incorporated into the selected alternative. The components should be categorized as one or more of the following four EPA definitions: Green Infrastructure, Water Efficiency, Energy Efficiency or Environmentally Innovative. Reference: April 21, 2010 EPA Procedures for implementing Certain Provisions of EPA's Fiscal Year 2010 Appropriation Affecting the Clean Water and Drinking Water State Revolving Fund Programs, Attachment 2: 2010 Clean Water and Drinking Water State Revolving Fund 20% Green Project Reserve: Guidance for Determining Project Eligibility. This document can be found on the CDPHE WQCD FSU website : http://www.cdphe.state.co.us/wq/Grantsandloansunit/index.html	Page 37	
(6.5) Costs	Provide more detailed project related capital costs, operation and maintenance budget – staffing, training, materials, electricity, lab expenses, residual disposal etc.; replacement costs; compare current and proposed user rates; and 20-year cash flow projection spreadsheet.	Page 37-38	
(6.6) Project Implementation	Hold a public meeting with 30-day notice period and summarize outcome; financing recommendations; required legal arrangements and/or intergovernmental agreements; a schedule and/or time line required for the general implementation steps outlined below in 6.4a-6.4e. (Some of these time lines will overlap.)	Page 38	
(6.6a) Preliminary Effluent Limits (PEL) Application and Site Application	Include as part of the implementation plan, the PEL and site applications and associated time schedule with those activities. Typically there should be 4-6 weeks for application and receipt of PEL's. Site approval is typically 6-8 weeks once the Division receives a complete application. PEL's must be a part of a complete site application. Signatures required in the site application typically require the applicant to get on the meeting agendas of the Management Agencies, County Commissioners and Local Boards of Health.	Page 38	
(6.6b) Process Design	This report should be submitted after site application approval and prior to final design. Include date and time frame (minimum WQCD review time is 30 days). (Ref. WQCD Policy 96-1; Sec. 1.3.0)	Page 38	
(6.6c) Final Design	Include approximate date and time frame (minimum Division review time is 45 days). (Ref. WQCD Policy 96-1; Sec.1)	Page 38	
(6.6d) Discharge Permit	Minimum application time is 180 days prior to discharge. (Ref. WQCD Regulation 61).	Page 38	

**AUTHORIZATION TO DISCHARGE UNDER THE
COLORADO DISCHARGE PERMIT SYSTEM**

In compliance with the provisions of the Colorado Water Quality Control Act, (25-8-101 et seq., CRS, 1973 as amended), for both discharges to surface and ground waters, and the Federal Water Pollution Control Act, as amended (33 U.S.C. 1251 et seq.; the "Act"), for discharges to surface waters only, the

Riverglen Home Owners' Association

is authorized to discharge from the Riverglen HOA wastewater treatment plant located **in the SE 1/4 Section 27, T4N, R69W; approximately 200 m north of NW corner of Wagonwheel Court and Larimer County Road 17; at 40.278116667° latitude North and 105.092683333° longitude West**

to **Little Thompson River**

in accordance with effluent limitations, monitoring requirements and other conditions set forth in Parts I and II hereof. All discharges authorized herein shall be consistent with the terms and conditions of this permit.

The applicant may demand an adjudicatory hearing within thirty (30) days of the date of issuance of the final permit determination, per the Colorado State Discharge Permit System Regulation 61.7(1). Should the applicant choose to contest any of the effluent limitations, monitoring requirements or other conditions contained herein, the applicant must comply with Section 24-4-104 CRS 1973 and the Colorado State Discharge Permit System Regulations. Failure to contest any such effluent limitation, monitoring requirement, or other condition, constitutes consent to the condition by the applicant.

This permit and the authorization to discharge shall expire at midnight, October 31, 2016

Issued and Signed this 15th day of September 2011

COLORADO DEPARTMENT OF PUBLIC HEALTH AND ENVIRONMENT



Janet Kieler, Permits Section Manager
Water Quality Control Division

**ISSUED AND SIGNED SEPTEMBER 15, 2011
EFFECTIVE NOVEMBER 1, 2011**

TABLE OF CONTENTS

PART I.....	3
A. EFFLUENT LIMITATIONS AND MONITORING REQUIREMENTS.....	3
1. Permitted Features.....	3
2. Limitations, Monitoring Frequencies and Sample Types for Effluent Parameters.....	3
3. Monitoring Frequency and Sample Type Influent Parameters.....	4
B. TERMS AND CONDITIONS.....	5
1. Service Area.....	5
2. Design Capacity.....	5
3. Expansion Requirements.....	5
4. Facilities Operation and Maintenance.....	6
5. Compliance Schedule(s).....	6
6. Industrial Waste Management.....	7
C. DEFINITION OF TERMS.....	9
D. GENERAL MONITORING, SAMPLING AND REPORTING REQUIREMENTS.....	11
1. Routine Reporting of Data.....	11
2. Annual Biosolids Report.....	11
3. Representative Sampling.....	12
4. Influent and Effluent Sampling Points.....	12
5. Analytical and Sampling Methods for Monitoring.....	12
6. Records.....	13
7. Flow Measuring Devices.....	14
8. Signatory Requirements.....	14
PART II.....	16
A. NOTIFICATION REQUIREMENTS.....	16
1. Notification to Parties.....	16
2. Change in Discharge.....	16
3. Special Notifications - Definitions.....	16
4. Noncompliance Notification.....	17
5. Other Notification Requirements.....	17
6. Bypass Notification.....	18
7. Upsets.....	18
8. Discharge Point.....	19
9. Proper Operation and Maintenance.....	19
10. Minimization of Adverse Impact.....	19
11. Removed Substances.....	19
12. Submission of Incorrect or Incomplete Information.....	19
13. Bypass.....	19
14. Reduction, Loss, or Failure of Treatment Facility.....	20
B. RESPONSIBILITIES.....	20
1. Inspections and Right to Entry.....	20
2. Duty to Provide Information.....	20
3. Transfer of Ownership or Control.....	20
4. Availability of Reports.....	21
5. Modification, Suspension, Revocation, or Termination of Permits By the Division.....	21
6. Oil and Hazardous Substance Liability.....	23
7. State Laws.....	23
8. Permit Violations.....	24
9. Property Rights.....	24
10. Severability.....	24
11. Renewal Application.....	24
12. Confidentiality.....	24
13. Fees.....	24
14. Duration of Permit.....	24
15. Section 307 Toxics.....	24
16. Effect of Permit Issuance.....	25
PART III.....	26

PART I

A. EFFLUENT LIMITATIONS AND MONITORING REQUIREMENTS

1. Permitted Features

Beginning no later than the effective date of this permit and lasting through the expiration date, the permittee is authorized to discharge from, and self monitoring samples taken in accordance with the monitoring requirements shall be obtained from permitted feature:

001A following disinfection and prior to mixing with the receiving stream. 40.293611° N, 105.058889° W

The location provided above will serve as the point of compliance for this permit and it is appropriate as it is located after all treatment and prior to discharge to the receiving water.

In accordance with the Water Quality Control Commission Regulations for Effluent Limitations, Section 62.4, and the Colorado Discharge Permit System Regulations, Section 61.8(2), 5 C.C.R. 1002-61, the permitted discharge shall not contain effluent parameter concentrations which exceed the following limitations specified below or exceed the specified flow limitation.

2. Limitations, Monitoring Frequencies and Sample Types for Effluent Parameters

In order to obtain an indication of the probable compliance or noncompliance with the effluent limitations specified in Part I.A, the permittee shall monitor all effluent parameters at the frequencies and sample types specified below. Such monitoring will begin immediately and last for the life of the permit unless otherwise noted. The results of such monitoring shall be reported on the Discharge Monitoring Report form (See Part I.D.).

Self-monitoring sampling by the permittee for compliance with the monitoring requirements specified above shall be performed at the location noted in Part I.A.1 above.

If the permittee, using an approved analytical method, monitors any parameter more frequently than required by this permit, then the results of such monitoring shall be included in the calculation and reporting of the values required in the Discharge Monitoring Report Form (DMRs) or other forms as required by the Division. Such increased frequency shall also be indicated.

Percentage Removal Requirements (BOD₅) – As noted in the limits table, the arithmetic mean of the BOD₅ concentrations for effluent samples collected during the calendar month shall demonstrate a minimum of eighty-five percent (85%) removal of BOD₅, as measured by dividing the respective difference between the mean influent and effluent concentrations for the calendar month by the respective mean influent concentration for the calendar month, and multiplying the quotient by 100.

Oil and Grease Monitoring: For every outfall with oil and grease monitoring, in the event an oil sheen or floating oil is observed, a grab sample shall be collected and analyzed for oil and grease, and reported on the appropriate DMR under parameter 03582. In addition, corrective action shall be taken immediately to mitigate the discharge of oil and grease. A description of the corrective action taken should be included with the DMR.

Total Residual Chlorine: Monitoring for TRC is required only when chlorine is in use.

Flow Recording Device: This facility has two flow recording devices located at the point of inflow into the treatment facility and at the discharge from the treatment plant. The flow recording device located at the point of inflow will be used for recording and reporting of the influent flow and the flow recording device located at the discharge point will be used for recording and reporting of effluent flows. Reported effluent flows will be used to monitor compliance with the effluent flow limitation and the influent flows will be used to monitor compliance with the hydraulic loading to the plant.

Metals: Metals concentrations measured in compliance with the effluent monitoring requirements listed in Part I.A of this permit may be used to satisfy any pretreatment or industrial waste management metals monitoring requirements listed in Part I.B.6, if the metals are in the same form (i.e. total). The special sampling procedures (e.g. 24-hour composite samples) specified in Part I.B.6 must be followed.

Permitted Feature 001A

<u>ICIS Code</u>	<u>Effluent Parameter</u>	<u>Effluent Limitations Maximum Concentrations</u>			<u>Monitoring Requirements</u>	
		<u>30-Day Average</u>	<u>7-Day Average</u>	<u>Daily Maximum</u>	<u>Frequency</u>	<u>Sample Type</u>
50050	Effluent Flow (MGD)	0.029		Report	Daily	Recorder
00400	pH (su)			6.5-9	Weekly	Grab
51040	E. coli (#/100 ml)	126	252		Monthly	Grab
50060	TRC (mg/l) Until 12/31/2016	Report		0.5	Weekly	Grab
50060	TRC (mg/l) Beginning 01/01/2017	0.011		0.019	Weekly	Grab
00610	NH3 as N, Tot (mg/l) Monthly. Until 12/31/2016	Report		Report	Monthly	Grab
00610	NH3 as N, Tot (mg/l) Monthly. Beginning 01/01/2017				Monthly	Grab
00610	NH3 as N, Tot (mg/l) Jan	5.1		12	Monthly	Grab
00610	NH3 as N, Tot (mg/l) Feb	5.1		12	Monthly	Grab
00610	NH3 as N, Tot (mg/l) Mar	3.5		8.4	Monthly	Grab
00610	NH3 as N, Tot (mg/l) Apr	1.7		5.7	Monthly	Grab
00610	NH3 as N, Tot (mg/l) May	2.8		12	Monthly	Grab
00610	NH3 as N, Tot (mg/l) Jun	1.7		8.4	Monthly	Grab
00610	NH3 as N, Tot (mg/l) Jul	1.9		12	Monthly	Grab
00610	NH3 as N, Tot (mg/l) Aug	2.8		19	Monthly	Grab
00610	NH3 as N, Tot (mg/l) Sep	2.2		12	Monthly	Grab
00610	NH3 as N, Tot (mg/l) Oct	3.5		17	Monthly	Grab
00610	NH3 as N, Tot (mg/l) Nov	3.8		12	Monthly	Grab
00610	NH3 as N, Tot (mg/l) Dec	4.9		12	Monthly	Grab
00310	BOD5, effluent (mg/l)	30	45		Monthly	Grab
81010	BOD5 (% removal)	85 (min)			Monthly	Calculated
00530	TSS, effluent (mg/l)	75	110		Monthly	Grab
84066	Oil and Grease (visual)			Report	Weekly	Visual
03582	Oil and Grease (mg/l)			10	Contingent	Grab
01306	Cu, PD (µg/l)	Report		Report	Quarterly	Grab
01323	Se, PD (µg/l)	Report		Report	Quarterly	Grab

3. Monitoring Frequency and Sample Type Influent Parameters

Regardless of whether or not an effluent discharge occurs and in order to obtain an indication of the current influent loading as compared to the approved capacity specified in Part I.A.3 and Part I.B.2; the permittee shall monitor influent parameters at the following required frequencies, the results to be reported on the Discharge Monitoring Report (See Part I.D):

If the permittee monitors any parameter more frequently than required by the permit, using an approved test procedure or as specified in the permit, the result of this monitoring shall be included in the calculation and reporting of data to the Division.

Self-monitoring samples taken in compliance with the monitoring requirements specified above shall be taken at the following location(s): **Outfall 300I, at a representative point prior to biological treatment.**

Permitted Feature 300I

<u>ICIS Code</u>	<u>Influent Parameter</u>	<u>Frequency</u>	<u>Sample Type</u>
50050 G	Flow, MGD	Continuous	Recorder
00180 G	Plant Capacity (% of Capacity - Hydraulic) *	Monthly	Calculated
00310 G	BOD ₅ , mg/l	Monthly	Composite
00310 G	BOD ₅ , lbs/day	Monthly	Calculated
00180 G	Plant Capacity (% of Capacity - Organic) *	Monthly	Calculated
00530 G	Total Suspended Solids, TSS, mg/l	Monthly	Composite

* The % capacity is to be reported against the listed capacities of 0.029 MGD for the hydraulic capacity and 52 lbs/day for the organic capacities as noted in Site Approval 1810. The percentage should be calculated using the 30-day average values divided by the corresponding capacity, times 100.

B. TERMS AND CONDITIONS

1. Service Area

All wastewater flows contributed in the service area may be accepted by the Riverglen Home Owners' Association for treatment at the permittee's wastewater treatment plant provided that such acceptance does not cause or contribute to an exceedance of the throughput or design capacity of the treatment works or the effluent limitations in Part I.A, or constitute a substantial impact to the functioning of the treatment works, degrade the quality of the receiving waters, or harm human health, or the environment.

In addition, the permittee shall enter into and maintain service agreements with any municipalities that discharge into the wastewater treatment facility. The service agreements shall contain all provisions necessary to protect the financial, physical, and operational integrity of the wastewater treatment works.

2. Design Capacity

Based on Site Approval **1810**, the design capacity of this domestic wastewater treatment works is **0.029 million gallons per day (MGD)** for hydraulic flow (30-day average) and **52 lbs. BOD₅ per day** for organic loading (30-day average).

3. Expansion Requirements

Pursuant to Colorado Law, C.R.S. 25-8-501 (5 d & e), the permittee is required to initiate engineering and financial planning for expansion of the domestic wastewater treatment works whenever throughput reaches eighty (80) percent of the treatment capacity. Such planning may be deemed unnecessary upon a showing that the area served by the domestic wastewater treatment works has a stable or declining population; but this provision shall not be construed as preventing periodic review by the Division should it be felt that growth is occurring or will occur in the area.

The permittee shall commence construction of such domestic wastewater treatment works expansion whenever throughput reaches ninety-five (95) percent of the treatment capacity or, in the case of a municipality, either commence construction or cease issuance of building permits within such municipality until such construction is commenced; except that building permits may continue to be issued for any construction which would not have the effect of increasing the input of wastewater to the sewage treatment works of the municipality involved.

Where unusual circumstances result in throughput exceeding 80% of treatment capacity, the permittee may, in lieu of initiating planning for expansion, submit a report to the Division that demonstrates that it is unlikely that the event will reoccur, or even if it were to reoccur, that 95% of the treatment capacity would not be exceeded.

Where unusual circumstances result in throughput exceeding 95% of the treatment capacity, the permittee may, in lieu of initiating construction of the expansion, submit a report to the Division that demonstrates that the domestic wastewater treatment works was in compliance at all times during the events and that it is extremely unlikely that the event will reoccur.

Where the permittee submits a report pursuant to unusual circumstances, and the Division, upon review of such report, determines in writing to the permittee that the report does not support the required findings, the permittee shall initiate planning and/or construction of the domestic wastewater treatment works as appropriate.

4. Facilities Operation and Maintenance

The permittee shall at all times properly operate and maintain all facilities and systems of treatment and control including all portions of the collection system and lift stations owned by the permittee (and related appurtenances) which are installed or used by the permittee as necessary to achieve compliance with the conditions of this permit. Proper operation and maintenance also includes adequate laboratory controls and appropriate quality assurance procedures. This provision requires the operation of back-up or auxiliary facilities or similar systems when installed by the permittee only when necessary to achieve compliance with the conditions of the permit. However, the permittee shall operate, at a minimum, one complete set of each main line unit treatment process whether or not this process is needed to achieve permit effluent compliance. Any sludge produced at the wastewater treatment facility shall be disposed of in accordance with State and Federal guidelines and regulations.

5. Compliance Schedule(s)

All information and written reports required by the following compliance schedules should be directed to the Permits Unit for final review unless otherwise stated.

- a. Activities to Meet Total Ammonia and TRC – In order to meet Total Ammonia and TRC final limits, the following compliance schedule has been included in the permit.

Code	Event	Description	Due Date
06599	Hire a Consultant/ Professional Engineer	Submit a letter of notification that a Colorado licensed PE has been retained and funding for planning secured.	03/31/2012
CS011	Plan, Report, or Scope of Work	Submit report detailing progress in obtaining funding.	12/31/2012
73905	Engineering Plan	Submit a letter of notification that funding has been obtained for design and construction aspects and final plans specifications have been submitted to the Division. Note that a Site Application and a preliminary design must be submitted and approved by the Division prior to final plans and specifications.	06/30/2013
CS015	Commence Required Work or On-Site Construction	Submit a letter of notification that Final Design Approval has been received from the Division and construction has commenced.	06/30/2014
CS010	Status/Progress Report	Submit a construction progress report summarizing the progress in construction or other activities.	06/30/2015
CS010	Status/Progress	Submit a construction progress report summarizing the progress in	06/30/2016

	Report	construction or other activities.	
CS016	Complete Required Work or On-Site Construction	Complete construction of facilities or other appropriate actions, which will allow the permittee to meet the final limitations.	12/31/2016

No later than 14 calendar days following each date identified in the above schedules of compliance, the permittee shall submit either a report of progress or, in the case of specific actions being required by identified dates, a written notice of compliance or noncompliance, any remedial actions taken, and the probability of meeting the next scheduled requirement.

6. Industrial Waste Management

- a. The Permittee has the responsibility to protect the Domestic Wastewater Treatment Works (DWTW), as defined at section 25.8.103(5) of the Colorado Water Quality Control Act, or the Publicly-Owned Treatment Works (POTW), as defined at 40 CFR section 403.3(q) of the federal pretreatment regulations, from pollutants which would cause pass through or interference, as defined at 40 CFR 403.3(p) and (k), or otherwise be incompatible with operation of the treatment works including interference with the use or disposal of municipal sludge.
- b. Pretreatment Standards (40 CFR Section 403.5) developed pursuant to Section 307 of the Federal Clean Water Act (the Act) require that the Permittee shall not allow, under any circumstances, the introduction of the following pollutants to the DWTW from any source of non-domestic discharge:
 - i. Pollutants which create a fire or explosion hazard in the DWTW, including, but not limited to, wastestreams with a closed cup flashpoint of less than sixty (60) degrees Centigrade (140 degrees Fahrenheit) using the test methods specified in 40 CFR Section 261.21;
 - ii. Pollutants which will cause corrosive structural damage to the DWTW, but in no case discharges with a pH of lower than 5.0 s.u., unless the treatment facilities are specifically designed to accommodate such discharges;
 - iii. Solid or viscous pollutants in amounts which will cause obstruction to the flow in the DWTW, or otherwise interfere with the operation of the DWTW;
 - iv. Any pollutant, including oxygen demanding pollutants (e.g., BOD), released in a discharge at a flow rate and/or pollutant concentration which will cause Interference with any treatment process at the DWTW;
 - v. Heat in amounts which will inhibit biological activity in the DWTW resulting in Interference, but in no case heat in such quantities that the temperature at the DWTW treatment plant exceeds forty (40) degrees Centigrade (104 degrees Fahrenheit) unless the Approval Authority, upon request of the DWTW, approves alternate temperature limits;
 - vi. Petroleum oil, non-biodegradable cutting oil, or products of mineral oil origin in amounts that will cause Interference or Pass Through;
 - vii. Pollutants which result in the presence of toxic gases, vapors, or fumes within the DWTW in a quantity that may cause acute worker health and safety problems;
 - viii. Any trucked or hauled pollutants, except at discharge points designated by the DWTW; and
 - ix. Any specific pollutant that exceeds a local limitation established by the Permittee in accordance with the requirements of 40 CFR Section 403.5(c) and (d).
 - x. Any other pollutant which may cause Pass Through or Interference.

- c. EPA shall be the Approval Authority and the mailing address for all reporting and notifications to the Approval Authority shall be: USEPA 1595 Wynkoop St. 8ENF-W-NP, Denver, CO 80202-1129. Should the State be delegated authority to implement and enforce the Pretreatment Program in the future, the Permittee shall be notified of the delegation and the state permitting authority shall become the Approval Authority.
- d. In addition to the general limitations expressed above, more specific Pretreatment Standards have been and will be promulgated for specific industrial categories under Section 307 of the Act (40 CFR Part 405 et. seq.).
- e. The Permittee must notify the state permitting authority and the Approval Authority, of any new introductions by new or existing industrial users or any substantial change in pollutants from any industrial user within sixty (60) days following the introduction or change. Such notice must identify:
 - i. Any new introduction of pollutants into the DWTW from an industrial user which would be subject to Sections 301, 306, or 307 of the Act if it were directly discharging those pollutants; or
 - ii. Any substantial change in the volume or character of pollutants being introduced into the DWTW by any industrial user;
 - iii. For the purposes of this section, adequate notice shall include information on:
 - (A) The identity of the industrial user;
 - (B) The nature and concentration of pollutants in the discharge and the average and maximum flow of the discharge to be introduced into the DWTW; and
 - (C) Any anticipated impact of the change on the quantity or quality of effluent to be discharged from or biosolids or sludge produced at such DWTW.
 - iv. For the purposes of this section, an industrial user shall include:
 - (A) Any discharger subject to Categorical Pretreatment Standards under Section 307 of the Act and 40 CFR chapter I and subchapter N;
 - (B) Any discharger which has a process wastewater flow of 25,000 gallons or more per day;
 - (C) Any discharger contributing five percent or more of the average dry weather hydraulic or organic capacity of the DWTW treatment plant;
 - (D) Any discharger who is designated by the Approval Authority as having a reasonable potential for adversely affecting the DWTW's operation or for violating any Pretreatment Standard or requirements;
- f. At such time as a specific Pretreatment Standard or requirement becomes applicable to an industrial user of the Permittee, the state permitting authority and/or Approval Authority may, as appropriate:
 - i. Amend the Permittee's CDPS discharge permit to specify the additional pollutant(s) and corresponding effluent limitation(s) consistent with the applicable national Pretreatment Standards;
 - ii. Require the Permittee to specify, by ordinance, order, or other enforceable means, the type of pollutant(s) and the maximum amount which may be discharged to the Permittee's DWTW for treatment. Such requirement shall be imposed in a manner consistent with the program development requirements of the General Pretreatment Regulations at 40 CFR Part 403; and/or,
 - iii. Require the Permittee to monitor its discharge for any pollutant which may likely be discharged from the Permittee's DWTW, should the industrial user fail to properly pretreat its waste.

The state permitting authority and the Approval Authority retains, at all times, the right to take legal action against any source of nondomestic discharge, whether directly or indirectly controlled by the Permittee, for violations of a permit, order or

similar enforceable mechanism issued by the Permittee, violations of any Pretreatment Standard or requirement, or for failure to discharge at an acceptable level under national standards issued by EPA under 40 CFR, chapter I, subchapter N. In those cases where a CDPS permit violation has occurred because of the failure of the Permittee to properly develop and enforce Pretreatment Standards and requirements as necessary to protect the DWTW, the state permitting authority and/or Approval Authority shall hold the Permittee and/or industrial user responsible and may take legal action against the Permittee as well as the Industrial user(s) contributing to the permit violation.

C. DEFINITION OF TERMS

1. "Composite" sample is a minimum of four (4) grab samples collected at equally spaced two (2) hour intervals and proportioned according to flow. For a SBR type treatment system, a composite sample is defined as sampling equal aliquots during the beginning, middle and end of a decant period, for two consecutive periods during a day (if possible).
2. "Continuous" measurement, is a measurement obtained from an automatic recording device which continually measures provides measurements.
3. "Daily Maximum limitation" for all parameters except temperature, means the limitation for this parameter shall be applied as an instantaneous maximum (or, for pH or DO, instantaneous minimum) value. The instantaneous value is defined as the analytical result of any individual sample. DMRs shall include the maximum (and/or minimum) of all instantaneous values within the calendar month. Any instantaneous value beyond the noted daily maximum limitation for the indicated parameter shall be considered a violation of this permit.
4. "Geometric mean" for *E. coli* bacteria concentrations, the thirty (30) day and seven (7) day averages shall be determined as the geometric mean of all samples collected in a thirty (30) day period and the geometric mean of all samples taken in a seven (7) consecutive day period respectively. The geometric mean may be calculated using two different methods. For the methods shown, a, b, c, d, etc. are individual sample results, and n is the total number of samples.

Method 1:

Geometric Mean = $(a*b*c*d*...)^{(1/n)}$ "*" - means multiply

Method 2:

Geometric Mean = $\text{antilog} ([\log(a)+\log(b)+\log(c)+\log(d)+...]/n)$

Graphical methods, even though they may also employ the use of logarithms, may introduce significant error and may not be used.

In calculating the geometric mean, for those individual sample results that are reported by the analytical laboratory to be "less than" a numeric value, a value of 1 should be used in the calculations. If all individual analytical results for the month are reported to be less than numeric values, then report "less than" the largest of those numeric values on the monthly DMR. Otherwise, report the calculated value.

For any individual analytical result of "too numerous to count" (TNTC), that analysis shall be considered to be invalid and another sample shall be promptly collected for analysis. If another sample cannot be collected within the same sampling period for which the invalid sample was collected (during the same month if monthly sampling is required, during the same week if weekly sampling is required, etc.), then the following procedures apply:

- i. A minimum of two samples shall be collected for coliform analysis within the next sampling period.
- ii. If the sampling frequency is monthly or less frequent: For the period with the invalid sample results, leave the spaces on the corresponding DMR for reporting coliform results empty and attach to the DMR a letter noting that a result of TNTC was obtained for that period, and explain why another sample for that period had not been collected.

If the sampling frequency is more frequent than monthly: Eliminate the result of TNTC from any further calculations, and use all the other results obtained within that month for reporting purposes. Attach a letter noting that a result of TNTC was obtained, and list all individual analytical results and corresponding sampling dates for that month.

5. "Grab" sample, is a single "dip and take" sample so as to be representative of the parameter being monitored.
6. "In-situ" measurement is defined as a single reading, observation or measurement taken in the field at the point of discharge.
7. "Instantaneous" measurement is a single reading, observation, or measurement performed on site using existing monitoring facilities.
8. "Potentially dissolved (PD) metals fraction" is defined in the Basic Standards and Methodologies for Surface Water 1002-31, as that portion of a constituent measured from the filtrate of a water and suspended sediment sample that was first treated with nitric acid to a pH of 2 or less and let stand for 8 to 96 hours prior to sample filtration using a 0.40 or 0.45-UM (micron) membrane filter. Note the "potentially dissolved" method cannot be used where nitric acid will interfere with the analytical procedure used for the constituent measured.
9. "Quarterly measurement frequency" means samples may be collected at any time during the calendar quarter if a continual discharge occurs. If the discharge is intermittent, then samples shall be collected during the period that discharge occurs.
10. "Recorder" requires the continuous operation of a chart and/or totalizer (or drinking water rotor meters or pump hour meters where previously approved.)
11. "Seven (7) day average" means, with the exception of fecal coliform or *E. coli* bacteria (see geometric mean), the arithmetic mean of all samples collected in a seven (7) consecutive day period. When calculating the 7-day average, a value of zero should be used in place of any value that is less than the reporting limit. **If all values are less than the PQL, and the PQL is greater than the permit limit "BDL" should be reported. If all values are less than the PQL, and the PQL is less than or equal to the permit limit, "<x" should be reported, where "x" is the reporting limit. Otherwise, the calculated average shall be reported.** Note that it does not matter if a calculated average is greater or less than the PQL, it must be reported as a value. Such seven (7) day averages shall be calculated for all calendar weeks, which are defined as beginning on Sunday and ending on Saturday. If the calendar week overlaps two months (i.e. the Sunday is in one month and the Saturday in the following month), the seven (7) day average calculated for that calendar week shall be associated with the month that contains the Saturday. Samples may not be used for more than one (1) reporting period.
12. "Thirty (30) day average" means, except for fecal coliform or *E. coli* bacteria (see geometric mean), the arithmetic mean of all samples collected during a thirty (30) consecutive-day period. When calculating the 30-day average, a value of zero should be used in place of any value that is less than the PQL. **If all values are less than the PQL, and the PQL is greater than the permit limit "BDL" should be reported. If all values are less than the PQL, and the PQL is less than or equal to the permit limit, "<x" should be reported, where "x" is the reporting limit. Otherwise, the calculated average shall be reported.** Note that it does not matter if a calculated average is greater or less than the PQL, it must be reported as a value. The permittee shall report the appropriate mean of all self-monitoring sample data collected during the calendar month on the Discharge Monitoring Reports. Samples shall not be used for more than one (1) reporting period.
13. "Twenty four (24) hour composite" sample is a combination of at least eight (8) sample aliquots of at least 100 milliliters, collected at equally spaced intervals during the operating hours of a facility over a twenty-four (24) hour period. For volatile pollutants, aliquots must be combined in the laboratory immediately before analysis. The composite must be flow proportional; either the time interval between each aliquot or the volume of each aliquot must be proportional to either the wastewater or effluent flow at the time of sampling or the total wastewater or effluent flow since the collection of the previous aliquot. Aliquots may be collected manually or automatically.
14. "Twice Monthly" monitoring frequency means that two samples shall be collected each calendar month on separate weeks with at least one full week between the two sample dates. Also, there shall be at least one full week between the second sample of a month and the first sample of the following month.
15. "Visual" observation is observing the discharge to check for the presence of a visible sheen or floating oil.

16. "Water Quality Control Division" or "Division" means the state Water Quality Control Division as established in 25-8-101 et al.)

Additional relevant definitions are found in the Colorado Water Quality Control Act, CRS §§ 25-8-101 et seq., the Colorado Discharge Permit System Regulations, Regulation 61 (5 CCR 1002-61) and other applicable regulations.

D. GENERAL MONITORING, SAMPLING AND REPORTING REQUIREMENTS

1. Routine Reporting of Data

Reporting of the data gathered in compliance with Part I.A or Part I.B shall be on a **monthly** basis. Reporting of all data gathered shall comply with the requirements of Part I.D. (General Requirements). Monitoring results shall be summarized for each calendar month and reported on Division approved discharge monitoring report (DMR) forms (EPA form 3320-1).

The permittee must submit these forms either by mail, or by using the Division's Net-DMR service (when available). If mailed, one form shall be mailed to the Division, as indicated below, so that the DMR is received no later than the 28th day of the following month (for example, the DMR for the first calendar quarter must be received by the Division by April 28th). If no discharge occurs during the reporting period, "No Discharge" shall be reported.

The original signed copy of each discharge monitoring report (DMR) shall be submitted to the Division at the following address:

Colorado Department of Public Health and Environment
Water Quality Control Division
WQCD-P-B2
4300 Cherry Creek Drive South
Denver, Colorado 80246-1530

The Discharge Monitoring Report forms shall be filled out accurately and completely in accordance with requirements of this permit and the instructions on the forms. They shall be signed by an authorized person as identified in Part I.D.8.

2. Annual Biosolids Report

The permittee shall provide the results of all biosolids monitoring and information on management practices, land application sites, site restrictions and certifications. Such information shall be provided no later than **February 19th** of each year. Reports shall be submitted addressing all such activities that occurred in the previous calendar year. If no biosolids were applied to the land during the reporting period, "no biosolids applied" shall be reported. Until further notice, biosolids monitoring results shall be reported on forms, or copies of forms, provided by the Division. Annual Biosolids Reports required herein, shall be signed and certified in accordance with the Signatory Requirements, Part I.D, and submitted as follows:

The original copy of each form shall be submitted to the following address:

COLORADO DEPARTMENT OF PUBLIC HEALTH AND ENVIRONMENT,
WATER QUALITY CONTROL DIVISION
WQCD-PERMITS-B2
4300 CHERRY CREEK DRIVE SOUTH
DENVER, COLORADO 80246-1530

A copy of each form shall be submitted to the following address:

WATER PROGRAM REGIONAL BIOSOLIDS PROGRAM
UNITED STATES ENVIRONMENTAL PROTECTION AGENCY REGION VIII,
1595 WYNKOOP STREET
DENVER, CO 80202-2466

ATTENTION: BIOSOLIDS PROGRAM MANAGER

3. Representative Sampling

Samples and measurements taken for the respective identified monitoring points as required herein shall be representative of the volume and nature of: 1) all influent wastes received at the facility, including septage, biosolids, etc.; 2) the monitored effluent discharged from the facility; and 3) biosolids produced at the facility. All samples shall be taken at the monitoring points specified in this permit and, unless otherwise specified, before the influent, effluent, or biosolids wastestream joins or is diluted by any other wastestream, body of water, or substance. Monitoring points shall not be changed without notification to and prior approval by the Division.

4. Influent and Effluent Sampling Points

Influent and effluent sampling points shall be so designed or modified so that: 1) a sample of the influent can be obtained after preliminary treatment and prior to primary or biological treatment and 2) a sample of the effluent can be obtained at a point after the final treatment process and prior to discharge to state waters. The permittee shall provide access to the Division to sample at these points.

5. Analytical and Sampling Methods for Monitoring

The permittee shall install, calibrate, use and maintain monitoring methods and equipment, including biological and indicated pollutant monitoring methods. All sampling shall be performed by the permittee according to specified methods in 40 C.F.R. Part 136; methods approved by EPA pursuant to 40 C.F.R. Part 136; or methods approved by the Division, in the absence of a method specified in or approved pursuant to 40 C.F.R. Part 136.

If the permit contains a numeric effluent limit for a parameter, the analytical method and PQL selected for all monitoring conducted in accordance with this permit for that parameter shall be the one that can measure at or below the numeric effluent limit. If all specified analytical methods and corresponding PQLs are greater than the numeric effluent limit, then the analytical method with the lowest PQL shall be used.

If the permit contains a report only requirement for a parameter, the analytical method and PQL chosen shall be one that can measure at or below the potential numeric effluent limit(s) (maximum allowable pollutant concentration as shown in the WQA or fact sheet). If all analytical methods and corresponding PQLs are greater than the potential numeric effluent limit (s), then the analytical method with the lowest PQL shall be used.

If the permit contains an interim effluent limitation (a limit is report until such time as a numeric effluent limit becomes effective) for a parameter, the analytical method and PQL chosen for all monitoring conducted in accordance with this permit for the parameter shall be one that can measure to the final numeric effluent limit. If all analytical methods and corresponding PQLs are greater than the final numeric effluent limit (s), then the analytical method with the lowest PQL shall be used.

When the analytical method which complies with the above requirements has a PQL greater than the permit limit, the permittee shall report "BDL" on the DMR. Such reports will not be considered as violations of the permit limit, as long as the lowest available PQL is used for the analysis. When the analytical method which complies with the above requirements has a PQL that is equal to or less than the permit limitation, "< X" (where X = the actual PQL achieved by the laboratory) shall be reported on the DMR. For parameters that have only a monitoring or report only limitation, "< X" (where X = the actual PQL achieved by the laboratory) shall be reported on the DMR.

The present lowest PQLs for specific parameters, as determined by the State Laboratory (November 2008) are provided below. If the analytical method cannot achieve a PQL that is less than or equal to the permit limit, then the method, or a more precise method, must achieve a PQL that is less than or equal to the PQL in the table below. A listing of the PQLs for organic parameters that must meet the above requirement can be found in the Division's Practical Quantitation Limitation Guidance Document, July 2008.

These limits apply to the total recoverable or the potentially dissolved fraction of metals.

In the calculation of average concentrations, those analytical results that are less than the practical quantitation limit shall be considered to be zero for calculation purposes. If all individual analytical results that would be used in the calculations are below the practical quantitation limit, then "less than x ", where x is the practical quantitation limit, shall be reported on the monthly DMR. Otherwise, report the calculated value.

Parameter	Practical Quantitation Limits,	Parameter	Practical Quantitation Limits, µg/l
Aluminum	50 µg/l	Mercury	0.1 µg/l
Ammonia	1 mg/l	Mercury (low-level)	0.003 µg/l
Arsenic	1 µg/l	Nickel	50 µg/l
Barium	5 µg/l	N-Ammonia	50 µg/l
Beryllium	1 µg/l	N Nitrate/Nitrite	0.5 mg/l
BOD / CBOD	1 mg/l	N-Nitrate	50 µg/l
Boron	50 µg/l	N-Nitrite	10 µg/l
Cadmium	1 µg/l	Total Nitrogen	0.5 mg/l
Calcium	20 µg/l	Phenols	100 µg/l
Chloride	2 mg/l	Phosphorus	10 µg/l
Chlorine	0.1 mg/l	Radium 226	1 pCi/l
Total Residual Chlorine		Radium 228	1 pCi/l
DPD colorimetric	0.10 mg/l	Selenium	1 µg/l
Amperometric titration	0.05 mg/l	Silver	0.5 µg/l
Chromium	20 µg/l	Sodium	0.2 mg/l
Chromium, Hexavalent	20 µg/l	Sulfate	5 mg/l
Copper	5 µg/l	Sulfide	0.2 mg/l
Cyanide (Direct / Distilled)	10 µg/l	Total Dissolved Solids	10 mg/l
Cyanide, WAD+A47	5 µg/l	Total Suspended Solids	10 mg/l
Fluoride	0.1 mg/l	Thallium	1 µg/l
Iron	10 µg/l	Uranium	1 µg/l
Lead	1 µg/l	Zinc	10 µg/l
Magnesium	20 µg/l	Nonylphenol D7065	10 µg/l
Manganese	2 µg/l	Nonylphenol D7485	0.33 µg/l

6. Records

- a. The permittee shall establish and maintain records. Those records shall include, but not be limited to, the following:
 - i. The date, type, exact place, and time of sampling or measurements;
 - ii. The individual(s) who performed the sampling or measurements;
 - iii. The date(s) the analyses were performed;
 - iv. The individual(s) who performed the analyses;
 - v. The analytical techniques or methods used; and
 - vi. The results of such analyses.

- b. The permittee shall retain for a minimum of three (3) years records of all monitoring information, including all original strip chart recordings for continuous monitoring instrumentation, all calibration and maintenance records, copies of all reports required by this permit and records of all data used to complete the application for this permit. This period of retention shall be extended during the course of any unresolved litigation regarding the discharge of pollutants by the permittee or when requested by the Division or Regional Administrator.

7. Flow Measuring Devices

Unless exempted in Part I.A.2 of this permit, flow metering at the headworks shall be provided to give representative values of throughput and treatment of the wastewater system. The metering device shall be equipped with a local flow indication instrument and a flow indication-recording-totalization device suitable for providing permanent flow records, which should be in the plant control building.

For mechanical facilities, where influent flow metering is not practical and the same results may be obtained from metering at the effluent end of the treatment facility, this type of flow metering arrangement will be considered, and if approved, noted in Part I.A.2 of this permit. For lagoons, an instantaneous or continuous effluent flow measuring device shall be required in addition to the above described influent flow measuring device.

At the request of the Division, the permittee must be able to show proof of the accuracy of any flow-measuring device used in obtaining data submitted in the monitoring report. The flow-measuring device must indicate values within ten (10) percent of the actual flow entering the facility.

8. Signatory Requirements

- a. All reports and other information required by the Division, shall be signed and certified for accuracy by the permittee in accord with the following criteria:
 - i) In the case of corporations, by a responsible corporate officer. For purposes of this section, the responsible corporate officer is responsible for the overall operation of the facility from which the discharge described in the form originates;
 - ii) In the case of a partnership, by a general partner;
 - iii) In the case of a sole proprietorship, by the proprietor;
 - iv) In the case of a municipal, state, or other public facility, by either a principal executive officer, or ranking elected official. For purposes of this section, a principal executive officer has responsibility for the overall operation of the facility from which the discharge originates;
 - v) By a duly authorized representative of a person described above, only if:
 - 1) The authorization is made in writing by a person described in i, ii, iii, or iv above;
 - 2) The authorization specifies either an individual or a position having responsibility for the overall operation of the regulated facility or activity such as the position of plant manager, operator of a well or a well field, superintendent, position of equivalent responsibility, or an individual or position having overall responsibility for environmental matters for the company. (A duly authorized representative may thus be either a named individual or any individual occupying a named position); and,
 - 3) The written authorization is submitted to the Division.
- b. If an authorization as described in this section is no longer accurate because a different individual or position has responsibility for the overall operation of the facility, a new authorization satisfying the requirements of this section must be submitted to the Division prior to or together with any reports, information, or applications to be signed by an authorized representative.

The permittee, or the duly authorized representative shall make and sign the following certification on all such documents:

"I certify under penalty of law that this document and all attachments were prepared under my direction or supervision in accordance with a system designed to assure that qualified personnel properly gather and evaluate the information submitted. Based on my inquiry of the person or persons who manage the system, or those persons directly responsible

for gathering the information, the information submitted is to the best of my knowledge and belief, true, accurate and complete. I am aware that there are significant penalties for submitting false information, including the possibility of fine and imprisonment for knowing violations."

PART II

A. NOTIFICATION REQUIREMENTS

1. Notification to Parties

All notification requirements under this section shall be directed as follows:

- a. Oral Notifications, during normal business hours shall be to:

Water Quality Protection Section - Domestic Compliance Program
Water Quality Control Division
Telephone: (303) 692-3500

- b. Written notification shall be to:

Water Quality Protection Section - Domestic Compliance Program
Water Quality Control Division
Colorado Department of Public Health and Environment
WQCD-WQP-B2
4300 Cherry Creek Drive South
Denver, CO 80246-1530

2. Change in Discharge

The permittee shall notify the Division, in writing, of any planned physical alterations or additions to the permitted facility. Notice is required only when:

- a. The alteration or addition could significantly change the nature or increase the quantity of pollutants discharged, or;
- b. The alteration or addition results in a significant change in the permittee's sludge use or disposal practices, and such alteration, addition, or change may justify the application of permit conditions that are different from or absent in the existing permit, including notification of additional use or disposal sites not reported pursuant to an approved land application plan.

The permittee shall give advance notice to the Division of any planned changes in the permitted facility or activity which may result in noncompliance with permit requirements.

Whenever notification of any planned physical alterations or additions to the permitted facility is required pursuant to this section, the permittee shall furnish the Division such plans and specifications which the Division deems reasonably necessary to evaluate the effect on the discharge, the stream, or ground water. If the Division finds that such new or altered discharge might be inconsistent with the conditions of the permit, the Division shall require a new or revised permit application and shall follow the procedures specified in Sections 61.5 through 61.6, and 61.15 of the Colorado Discharge Permit System Regulations.

3. Special Notifications - Definitions

- a. **Bypass:** The intentional diversion of waste streams from any portion of a treatment facility.
- b. **Severe Property Damage:** Substantial physical damage to property at the treatment facilities which causes them to become inoperable, or substantial and permanent loss of natural resources which can reasonably be expected to occur in the absence of a bypass. It does not mean economic loss caused by delays in production.
- c. **Upset:** An exceptional incident in which there is unintentional and temporary noncompliance with permit effluent limitations because of factors beyond the reasonable control of the permittee. An upset does not include noncompliance

to the extent caused by operational error, improperly designed treatment facilities, inadequate treatment facilities, lack of preventative maintenance, or careless or improper operation.

4. **Noncompliance Notification**

- a. If, for any reason, the permittee does not comply with or will be unable to comply with any discharge limitations or standards specified in this permit, the permittee shall, at a minimum, provide the Division and EPA with the following information:
 - i) A description of the discharge and cause of noncompliance;
 - ii) The period of noncompliance, including exact dates and times and/or the anticipated time when the discharge will return to compliance; and
 - iii) Steps being taken to reduce, eliminate, and prevent recurrence of the noncomplying discharge.
- b. The permittee shall report the following circumstances **orally within twenty-four (24) hours** from the time the permittee becomes aware of the circumstances, and shall mail to the Division a written report containing the information requested in Part II.A.4 (a) **within five (5) days** after becoming aware of the following circumstances:
 - i) Circumstances leading to any noncompliance which may endanger health or the environment regardless of the cause of the incident;
 - ii) Circumstances leading to any unanticipated bypass which exceeds any effluent limitations in the permit;
 - iii) Circumstances leading to any upset which causes an exceedance of any effluent limitation in the permit;
 - iv) Daily maximum violations for any of the pollutants limited by Part I.A of this permit and specified as requiring 24-hour notification. This includes any toxic pollutant or hazardous substance or any pollutant specifically identified as the method to control any toxic pollutant or hazardous substance.
- c. Unless otherwise indicated in this permit, the permittee shall report instances of non-compliance which are not required to be reported within 24-hours at the time Discharge Monitoring Reports are submitted. The reports shall contain the information listed in sub-paragraph (a) of this section.

5. **Other Notification Requirements**

Reports of compliance or noncompliance with, or any progress reports on, interim and final requirements contained in any compliance schedule in the permit shall be submitted no later than fourteen (14) days following each scheduled date, unless otherwise provided by the Division.

The permittee shall notify the Division, in writing, thirty (30) days in advance of a proposed transfer of permit as provided in Part II.B.3.

The permittee's notification of all anticipated noncompliance does not stay any permit condition.

All existing manufacturing, commercial, mining, and silvicultural dischargers must notify the Division as soon as they know or have reason to believe:

- a. That any activity has occurred or will occur which would result in the discharge, on a routine or frequent basis, of any toxic pollutant which is not limited in the permit, if that discharge will exceed the highest of the following "notification levels":
 - i) One hundred micrograms per liter (100 µg/l);
 - ii) Two hundred micrograms per liter (200 µg/l) for acrolein and acrylonitrile; five hundred micrograms per liter (500 µg/l) for 2,4-dinitrophenol and 2-methyl-4,6-dinitrophenol; and one milligram per liter (1.0 mg/l) for antimony;

- iii) Five (5) times the maximum concentration value reported for that pollutant in the permit application in accordance with Section 61.4(2)(g).
 - iv) The level established by the Division in accordance with 40 C.F.R. § 122.44(f).
- b. That any activity has occurred or will occur which would result in any discharge, on a non-routine or infrequent basis, of a toxic pollutant which is not limited in the permit, if that discharge will exceed the highest of the following "notification levels":
- i) Five hundred micrograms per liter (500 µg/l);
 - ii) One milligram per liter (1 mg/l) for antimony; and
 - iii) Ten (10) times the maximum concentration value reported for that pollutant in the permit application.
 - iv) The level established by the Division in accordance with 40 C.F.R. § 122.44(f).

6. **Bypass Notification**

If the permittee knows in advance of the need for a bypass, a notice shall be submitted, at least ten days before the date of the bypass, to the Division. The bypass shall be subject to Division approval and limitations imposed by the Division. Violations of requirements imposed by the Division will constitute a violation of this permit.

7. **Upsets**

a. Effect of an Upset

An upset constitutes an affirmative defense to an action brought for noncompliance with permit effluent limitations if the requirements of paragraph (b) of this section are met. No determination made during administrative review of claims that noncompliance was caused by upset, and before an action for noncompliance, is final administrative action subject to judicial review.

b. Conditions Necessary for a Demonstration of Upset

A permittee who wishes to establish the affirmative defense of upset shall demonstrate through properly signed contemporaneous operating logs, or other relevant evidence that:

- i) An upset occurred and that the permittee can identify the specific cause(s) of the upset; and
- ii) The permitted facility was at the time being properly operated and maintained; and
- iii) The permittee submitted proper notice of the upset as required in Part II.A.4. of this permit (24-hour notice); and
- iv) The permittee complied with any remedial measure necessary to minimize or prevent any discharge or sludge use or disposal in violation of this permit which has a reasonable likelihood of adversely affecting human health or the environment.

In addition to the demonstration required above, a permittee who wishes to establish the affirmative defense of upset for a violation of effluent limitations based upon water quality standards shall also demonstrate through monitoring, modeling or other methods that the relevant standards were achieved in the receiving water.

c. Burden of Proof

In any enforcement proceeding the permittee seeking to establish the occurrence of an upset has the burden of proof.

8. Discharge Point

Any discharge to the waters of the State from a point source other than specifically authorized by this permit is prohibited.

9. Proper Operation and Maintenance

The permittee shall at all times properly operate and maintain all facilities and systems of treatment and control including all portions of the collection system and lift stations owned by the permittee (and related appurtenances) which are installed or used by the permittee as necessary to achieve compliance with the conditions of this permit. Proper operation and maintenance includes effective performance and adequate laboratory and process controls, including appropriate quality assurance procedures (40 CFR 122.41(e)). This provision requires the operation of back-up or auxiliary facilities or similar systems which are installed by the permittee only when necessary to achieve compliance with the conditions of the permit.

10. Minimization of Adverse Impact

The permittee shall take all reasonable steps to minimize or prevent any discharge of sludge use or disposal in violation of this permit which has a reasonable likelihood of adversely affecting human health or the environment. As necessary, accelerated or additional monitoring to determine the nature and impact of the noncomplying discharge is required.

11. Removed Substances

Solids, sludges, or other pollutants removed in the course of treatment or control of wastewaters shall be disposed in accordance with applicable state and federal regulations.

For all domestic wastewater treatment works, at industrial facilities, the permittee shall dispose of sludge in accordance with all State and Federal regulations.

12. Submission of Incorrect or Incomplete Information

Where the permittee failed to submit any relevant facts in a permit application, or submitted incorrect information in a permit application or report to the Division, the permittee shall promptly submit the relevant information which was not submitted or any additional information needed to correct any erroneous information previously submitted.

13. Bypass

- a. Bypasses are prohibited and the Division may take enforcement action against the permittee for bypass, unless:
 - i) The bypass is unavoidable to prevent loss of life, personal injury, or severe property damage;
 - ii) There were no feasible alternatives to bypass such as the use of auxiliary treatment facilities, retention of untreated wastes, or maintenance during normal periods of equipment downtime. This condition is not satisfied if adequate back-up equipment should have been installed in the exercise of reasonable engineering judgment to prevent a bypass which occurred during normal periods of equipment downtime or preventive maintenance; and
 - iii) Proper notices were submitted in compliance with Part II.A.4.
- b. "Severe property damage" as used in this Subsection means substantial physical damage to the treatment facilities which causes them to become inoperable, or substantial and permanent loss of natural resources which can reasonably be expected to occur in the absence of a bypass. Severe property damage does not mean economic loss caused by delays in production.
- c. The permittee may allow a bypass to occur which does not cause effluent limitations to be exceeded, but only if it also is for essential maintenance or to assure optimal operation. These bypasses are not subject to the provisions of paragraph (a) above.

- d. The Division may approve an anticipated bypass, after considering adverse effects, if the Division determines that the bypass will meet the conditions specified in paragraph (a) above.

14. Reduction, Loss, or Failure of Treatment Facility

The permittee has the duty to halt or reduce any activity if necessary to maintain compliance with the effluent limitations of the permit. Upon reduction, loss, or failure of the treatment facility, the permittee shall, to the extent necessary to maintain compliance with its permit, control production, control sources of wastewater, or all discharges, until the facility is restored or an alternative method of treatment is provided. This provision also applies to power failures, unless an alternative power source sufficient to operate the wastewater control facilities is provided.

It shall not be a defense for a permittee in an enforcement action that it would be necessary to halt or reduce the permitted activity in order to maintain compliance with the conditions of this permit.

B. RESPONSIBILITIES

1. Inspections and Right to Entry

The permittee shall allow the Division and/or the authorized representative, upon the presentation of credentials:

- a. To enter upon the permittee's premises where a regulated facility or activity is located or in which any records are required to be kept under the terms and conditions of this permit;
- b. At reasonable times to have access to and copy any records required to be kept under the terms and conditions of this permit and to inspect any monitoring equipment or monitoring method required in the permit; and
- c. To enter upon the permittee's premises in a reasonable manner and at a reasonable time to inspect and/or investigate, any actual, suspected, or potential source of water pollution, or to ascertain compliance or non compliance with the Colorado Water Quality Control Act or any other applicable state or federal statute or regulation or any order promulgated by the Division. The investigation may include, but is not limited to, the following: sampling of any discharge and/or process waters, the taking of photographs, interviewing of any person having knowledge related to the discharge permit or alleged violation, access to any and all facilities or areas within the permittee's premises that may have any effect on the discharge, permit, or alleged violation. Such entry is also authorized for the purpose of inspecting and copying records required to be kept concerning any effluent source.
- d. The permittee shall provide access to the Division to sample the discharge at a point after the final treatment process but prior to the discharge mixing with state waters upon presentation of proper credentials.

In the making of such inspections, investigations, and determinations, the Division, insofar as practicable, may designate as its authorized representatives any qualified personnel of the Department of Agriculture. The Division may also request assistance from any other state or local agency or institution.

2. Duty to Provide Information

The permittee shall furnish to the Division, within a reasonable time, any information which the Division may request to determine whether cause exists for modifying, revoking and reissuing, or terminating this permit, or to determine compliance with this permit. The permittee shall also furnish to the Division, upon request, copies of records required to be kept by this permit.

3. Transfer of Ownership or Control

- a. Except as provided in paragraph b. of this section, a permit may be transferred by a permittee only if the permit has been modified or revoked and reissued as provided in Section 61.8(8) of the Colorado Discharge Permit System Regulations, to identify the new permittee and to incorporate such other requirements as may be necessary under the Federal Act.

- b. A permit may be automatically transferred to a new permittee if:
 - i) The current permittee notifies the Division in writing 30 days in advance of the proposed transfer date; and
 - ii) The notice includes a written agreement between the existing and new permittee(s) containing a specific date for transfer of permit responsibility, coverage and liability between them; and
 - iii) The Division does not notify the existing permittee and the proposed new permittee of its intent to modify, or revoke and reissue the permit.
 - iv) Fee requirements of the Colorado Discharge Permit System Regulations, Section 61.15, have been met.

4. Availability of Reports

Except for data determined to be confidential under Section 308 of the Federal Clean Water Act and the Colorado Discharge Permit System Regulations 5 CCR 1002-61, Section 61.5(4), all reports prepared in accordance with the terms of this permit shall be available for public inspection at the offices of the Division and the Environmental Protection Agency.

The name and address of the permit applicant(s) and permittee(s), permit applications, permits and effluent data shall not be considered confidential. Knowingly making false statement on any such report may result in the imposition of criminal penalties as provided for in Section 309 of the Federal Clean Water Act, and Section 25-8-610 C.R.S.

5. Modification, Suspension, Revocation, or Termination of Permits By the Division

The filing of a request by the permittee for a permit modification, revocation and reissuance, termination or a notification of planned changes or anticipated noncompliance, does not stay any permit condition.

- a. A permit may be modified, suspended, or terminated in whole or in part during its term for reasons determined by the Division including, but not limited to, the following:
 - i) Violation of any terms or conditions of the permit;
 - ii) Obtaining a permit by misrepresentation or failing to disclose any fact which is material to the granting or denial of a permit or to the establishment of terms or conditions of the permit; or
 - iii) Materially false or inaccurate statements or information in the permit application or the permit.
 - iv) A determination that the permitted activity endangers human health or the classified or existing uses of state waters and can only be regulated to acceptable levels by permit modifications or termination.
- b. A permit may be modified in whole or in part for the following causes, provided that such modification complies with the provisions of Section 61.10 of the Colorado Discharge Permit System Regulations:
 - i) There are material and substantial alterations or additions to the permitted facility or activity which occurred after permit issuance which justify the application of permit conditions that are different or absent in the existing permit.
 - ii) The Division has received new information which was not available at the time of permit issuance (other than revised regulations, guidance, or test methods) and which would have justified the application of different permit conditions at the time of issuance. For permits issued to new sources or new dischargers, this cause includes information derived from effluent testing required under Section 61.4(7)(e) of the Colorado Discharge Permit System Regulations. This provision allows a modification of the permit to include conditions that are less stringent than the existing permit only to the extent allowed under Section 61.10 of the Colorado Discharge Permit System Regulations.

- iii) The standards or regulations on which the permit was based have been changed by promulgation of amended standards or regulations or by judicial decision after the permit was issued. Permits may be modified during their terms for this cause only as follows:
 - (A) The permit condition requested to be modified was based on a promulgated effluent limitation guideline, EPA approved water quality standard, or an effluent limitation set forth in 5 CCR 1002-62, § 62 et seq.; and
 - (B) EPA has revised, withdrawn, or modified that portion of the regulation or effluent limitation guideline on which the permit condition was based, or has approved a Commission action with respect to the water quality standard or effluent limitation on which the permit condition was based; and
 - (C) The permittee requests modification after the notice of final action by which the EPA effluent limitation guideline, water quality standard, or effluent limitation is revised, withdrawn, or modified; or
 - (D) For judicial decisions, a court of competent jurisdiction has remanded and stayed EPA promulgated regulations or effluent limitation guidelines, if the remand and stay concern that portion of the regulations or guidelines on which the permit condition was based and a request is filed by the permittee in accordance with this Regulation, within ninety (90) days of judicial remand.
 - iv) The Division determines that good cause exists to modify a permit condition because of events over which the permittee has no control and for which there is no reasonable available remedy.
 - v) The permittee has received a variance.
 - vi) When required to incorporate applicable toxic effluent limitation or standards adopted pursuant to § 307(a) of the Federal act.
 - vii) When required by the reopener conditions in the permit.
 - viii) As necessary under 40 C.F.R. 403.8(e), to include a compliance schedule for the development of a pretreatment program.
 - ix) When the level of discharge of any pollutant which is not limited in the permit exceeds the level which can be achieved by the technology-based treatment requirements appropriate to the permittee under Section 61.8(2) of the Colorado Discharge Permit System Regulations.
 - x) To establish a pollutant notification level required in Section 61.8(5) of the Colorado Discharge Permit System Regulations.
 - xi) To correct technical mistakes, such as errors in calculation, or mistaken interpretations of law made in determining permit conditions, to the extent allowed in Section 61.10 of the Colorado State Discharge Permit System Regulations.
 - xii) When required by a permit condition to incorporate a land application plan for beneficial reuse of sewage sludge, to revise an existing land application plan, or to add a land application plan.
 - xiii) For any other cause provided in Section 61.10 of the Colorado Discharge Permit System Regulations.
- c. At the request of a permittee, the Division may modify or terminate a permit and issue a new permit if the following conditions are met:
- i) The Regional Administrator has been notified of the proposed modification or termination and does not object in writing within thirty (30) days of receipt of notification,
 - ii) The Division finds that the permittee has shown reasonable grounds consistent with the Federal and State statutes and regulations for such modifications or termination;

- iii) Requirements of Section 61.15 of the Colorado Discharge Permit System Regulations have been met, and
 - iv) Requirements of public notice have been met.
- d. Permit modification (except for minor modifications), termination or revocation and reissuance actions shall be subject to the requirements of Sections 61.5(2), 61.5(3), 61.6, 61.7 and 61.15 of the Colorado Discharge Permit System Regulations. The Division shall act on a permit modification request, other than minor modification requests, within 180 days of receipt thereof. Except for minor modifications, the terms of the existing permit govern and are enforceable until the newly issued permit is formally modified or revoked and reissued following public notice.
- e. Upon consent by the permittee, the Division may make minor permit modifications without following the requirements of Sections 61.5(2), 61.5(3), 61.7, and 61.15 of the Colorado Discharge Permit System Regulations. Minor modifications to permits are limited to:
- i) Correcting typographical errors; or
 - ii) Increasing the frequency of monitoring or reporting by the permittee; or
 - iii) Changing an interim date in a schedule of compliance, provided the new date of compliance is not more than 120 days after the date specific in the existing permit and does not interfere with attainment of the final compliance date requirement; or
 - iv) Allowing for a transfer in ownership or operational control of a facility where the Division determines that no other change in the permit is necessary, provided that a written agreement containing a specific date for transfer of permit responsibility, coverage and liability between the current and new permittees has been submitted to the Division; or
 - v) Changing the construction schedule for a discharger which is a new source, but no such change shall affect a discharger's obligation to have all pollution control equipment installed and in operation prior to discharge; or
 - vi) Deleting a point source outfall when the discharge from that outfall is terminated and does not result in discharge of pollutants from other outfalls except in accordance with permit limits.
- f. When a permit is modified, only the conditions subject to modification are reopened. If a permit is revoked and reissued, the entire permit is reopened and subject to revision and the permit is reissued for a new term.
- g. The filing of a request by the permittee for a permit modification, revocation and reissuance or termination does not stay any permit condition.
- h. All permit modifications and reissuances are subject to the antibacksliding provisions set forth in 61.10(e) through (g).

6. Oil and Hazardous Substance Liability

Nothing in this permit shall be construed to preclude the institution of any legal action or relieve the permittee from any responsibilities, liabilities, or penalties to which the permittee is or may be subject to under Section 311 (Oil and Hazardous Substance Liability) of the Clean Water Act.

7. State Laws

Nothing in this permit shall be construed to preclude the institution of any legal action or relieve the permittee from any responsibilities, liabilities, or penalties established pursuant to any applicable State law or regulation under authority granted by Section 510 of the Clean Water Act. Nothing in this permit shall be construed to prevent or limit application of any emergency power of the division.

8. Permit Violations

Failure to comply with any terms and/or conditions of this permit shall be a violation of this permit. The discharge of any pollutant identified in this permit more frequently than or at a level in excess of that authorized shall constitute a violation of the permit. Except as provided in Part I.D and Part II.A or B, nothing in this permit shall be construed to relieve the permittee from civil or criminal penalties for noncompliance (40 CFR 122.41(a)(1)).

9. Property Rights

The issuance of this permit does not convey any property or water rights in either real or personal property, or stream flows, or any exclusive privileges, nor does it authorize any injury to private property or any invasion of personal rights, nor any infringement of Federal, State or local laws or regulations.

10. Severability

The provisions of this permit are severable. If any provisions of this permit, or the application of any provision of this permit to any circumstance, is held invalid, the application of such provision to other circumstances and the application of the remainder of this permit shall not be affected.

11. Renewal Application

If the permittee desires to continue to discharge, a permit renewal application shall be submitted at least one hundred eighty (180) days before this permit expires. If the permittee anticipates there will be no discharge after the expiration date of this permit, the Division should be promptly notified so that it can terminate the permit in accordance with Part II.B.5.

12. Confidentiality

Any information relating to any secret process, method of manufacture or production, or sales or marketing data which has been declared confidential by the permittee, and which may be acquired, ascertained, or discovered, whether in any sampling investigation, emergency investigation, or otherwise, shall not be publicly disclosed by any member, officer, or employee of the Commission or the Division, but shall be kept confidential. Any person seeking to invoke the protection of this Subsection (12) shall bear the burden of proving its applicability. This section shall never be interpreted as preventing full disclosure of effluent data.

13. Fees

The permittee is required to submit payment of an annual fee as set forth in the 2005 amendments to the Water Quality Control Act. Section 25-8-502 (1) (b), and the Colorado Discharge Permit System Regulations 5 CCR 1002-61, Section 61.15 as amended. Failure to submit the required fee when due and payable is a violation of the permit and will result in enforcement action pursuant to Section 25-8-601 et. seq., C.R.S. 1973 as amended.

14. Duration of Permit

The duration of a permit shall be for a fixed term and shall not exceed five (5) years. Filing of a timely and complete application shall cause the expired permit to continue in force to the effective date of the new permit. The permit's duration may be extended only through administrative extensions and not through interim modifications.

15. Section 307 Toxics

If a toxic effluent standard or prohibition, including any applicable schedule of compliance specified, is established by regulation pursuant to Section 307 of the Federal Act for a toxic pollutant which is present in the permittee's discharge and such standard or prohibition is more stringent than any limitation upon such pollutant in the discharge permit, the Division shall institute proceedings to modify or revoke and reissue the permit to conform to the toxic effluent standard or prohibition.

16. Effect of Permit Issuance

- a. The issuance of a permit does not convey any property rights or any exclusive privilege.
- b. The issuance of a permit does not authorize any injury to person or property or any invasion of personal rights, nor does it authorize the infringement of federal, state, or local laws or regulations.
- c. Except for any toxic effluent standard or prohibition imposed under Section 307 of the Federal act or any standard for sewage sludge use or disposal under Section 405(d) of the Federal act, compliance with a permit during its term constitutes compliance, for purposes of enforcement, with Sections 301, 302, 306, 318, 403, and 405(a) and (b) of the Federal act. However, a permit may be modified, revoked and reissued, or terminated during its term for cause as set forth in Section 61.8(8) of the Colorado Discharge Permit System Regulations.
- d. Compliance with a permit condition which implements a particular standard for sewage sludge use or disposal shall be an affirmative defense in any enforcement action brought for a violation of that standard for sewage sludge use or disposal.

PART III
CATEGORICAL INDUSTRIES

Aluminum Forming	Meat Products
Asbestos Manufacturing	Metal Finishing
Battery Manufacturing	Metal Molding and Casting (Foundries)
Builders' Paper and Board Mills	Mineral Mining and Processing
Canned & Preserved Fruits and Vegetables Processing	Nonferrous Metals Manufacturing
Canned & Preserved Seafood Processing	Nonferrous Metals Forming and Metal Powders
Carbon Black Manufacturing	Oil and Gas Extraction
Cement Manufacturing	Organic Chemicals, Plastics, and Synthetic Fibers
Coal Mining	Ore Mining and Dressing
Coil Coating	Paint Formulation
Copper Forming	Paving and Roofing Materials (Tars and Asphalt)
Dairy Products Processing	Pesticide Chemicals
Electrical and Electronic Components	Petroleum Refining
Electroplating	Pharmaceutical Manufacturing
Explosives Manufacturing	Phosphate Manufacturing
Feedlots	Photographic
Ferroalloy Manufacturing	Plastics Molding and Forming
Fertilizer Manufacturing	Porcelain Enameling
Glass Manufacturing	Pulp, Paper, and Paperboard Manufacturing
Grain Mills	Rubber Manufacturing
Gum and Wood Chemicals Manufacturing	Soap and Detergent Manufacturing
Hospital	Steam Electric Power Generating
Ink Formulation	Sugar Processing
Inorganic Chemicals Manufacturing	Textile Mills
Iron and Steel Manufacturing	Timber Products Processing
Leather Tanning and Finishing	

PRIORITY POLLUTANTS AND HAZARDOUS SUBSTANCES

ORGANIC TOXIC POLLUTANTS IN EACH OF FOUR FRACTIONS
IN ANALYSIS BY GAS CHROMATOGRAPHY/MASS SPECTROSCOPY (GC/MS)

<u>Volatiles</u>	<u>Base/Neutral</u>	<u>Acid Compounds</u>	<u>Pesticides</u>
acrolein	acenaphthene	2-chlorophenol	aldrin
acrylonitrile	acenaphthylene	2,4-dichlorophenol	alpha-BHC
benzene	anthracene	2,4-dimethylphenol	beta-BHC
bromoform	benzidine	4,6-dinitro-o-cresol	gamma-BHC
carbon tetrachloride	benzo(a)anthracene	2,4-dinitrophenol	delta-BHC
chlorobenzene	benzo(a)pyrene	2-nitrophenol	chlordane
chlorodibromomethane	3,4-benzofluoranthene	4-nitrophenol	4,4'-DDT
chloroethane	benzo(ghi)perylene	p-chloro-m-cresol	4,4'-DDE
2-chloroethylvinyl ether	benzo(k)fluoranthene	pentachlorophenol	4,4'-DDD
chloroform	bis(2-chloroethoxy)methane	phenol	dieldrin
dichlorobromomethane	bis(2-chloroethyl)ether	2,4,6-trichlorophenol	alpha-endosulfan
1,1-dichloroethane	bis(2-chloroisopropyl)ether		beta-endosulfan
1,2-dichloroethane	bis(2-ethylhexyl)phthalate		endosulfan sulfate
1,1-dichloroethylene	4-bromophenyl phenyl ether		endrin
1,2-dichloropropane	butylbenzyl phthalate		endrin aldehyde
1,3-dichloropropylene	2-chloronaphthalene		heptachlor
ethylbenzene	4-chlorophenyl phenyl ether		heptachlor epoxide
methyl bromide	chrysene		PCB-1242
methyl chloride	dibenzo(a,h)anthracene		PCB-1254
methylene chloride	1,2-dichlorobenzene		PCB-1221

PRIORITY POLLUTANTS AND HAZARDOUS SUBSTANCES
ORGANIC TOXIC POLLUTANTS IN EACH OF FOUR FRACTIONS
IN ANALYSIS BY GAS CHROMATOGRAPHY/MASS SPECTROSCOPY (GC/MS)

Volatiles

1,1,2,2-tetrachloroethane
tetrachloroethylene
toluene
1,2-trans-dichloroethylene
1,1,1-trichloroethane
1,1,2-trichloroethane
trichloroethylene
vinyl chloride

Base/Neutral

1,3-dichlorobenzene
1,4-dichlorobenzene
3,3-dichlorobenzidine
diethyl phthalate
dimethyl phthalate
di-n-butyl phthalate
2,4-dinitrotoluene
2,6-dinitrotoluene
di-n-octyl phthalate
1,2-diphenylhydrazine (as azobenzene)
fluorene
fluoranthene
hexachlorobenzene
hexachlorobutadiene
hexachlorocyclopentadiene
hexachloroethane
indeno(1,2,3-cd)pyrene
isophorone
naphthalene
nitrobenzene
N-nitrosodimethylamine
N-nitrosodi-n-propylamine
N-nitrosodiphenylamine
phenanthrene
pyrene
1,2,4-trichlorobenzene

Acid Compounds

Pesticides

PCB-1232
PCB-1248
PCB-1260
PCB-1016
toxaphene

OTHER TOXIC POLLUTANTS
(METALS AND CYANIDE) AND TOTAL PHENOLS

Antimony, Total
Arsenic, Total
Beryllium, Total
Cadmium, Total
Chromium, Total
Copper, Total
Lead, Total
Mercury, Total
Nickel, Total
Selenium, Total
Silver, Total
Thallium, Total
Zinc, Total
Cyanide, Total
Phenols, Total

TOXIC POLLUTANTS AND HAZARDOUS SUBSTANCES
REQUIRED TO BE IDENTIFIED BY EXISTING DISCHARGERS
IF EXPECTED TO BE PRESENT

Toxic Pollutants

Asbestos

Hazardous Substances

Acetaldehyde	Isoprene
Allyl alcohol	Isopropanolamine
Allyl chloride	Keithane
Amyl acetate	Kepone
Aniline	Malathion
Benzonitrile	Mercaptodimethur
Benzyl chloride	Methoxychlor
Butyl acetate	Methyl mercaptan
Butylamine	Methyl methacrylate
Captan	Methyl parathion
Carbaryl	Mexacarbate
Carbofuran	Monoethyl amine
Carbon disulfide	Monomethyl amine
Chlorpyrifos	Naled
Coumaphos	Napthenic acid
Cresol	Nitrotoluene
Crotonaldehyde	Parathion
Cyclohexane	Phenolsulfanate
2,4-D(2,4-Dichlorophenoxy acetic acid)	Phosgene
Diazinon	Propargite
Dicamba	Propylene oxide
Dichlobenil	Pyrethrins
Dichlone	Quinoline
2,2-Dichloropropionic acid	Resorcinol
Dichlorvos	Strontium
Diethyl amine	Strychnine
Dimethyl amine	Styrene
Dinitrobenzene	TDE (Tetrachlorodiphenylethane)
Diquat	2,4,5-T (2,4,5-Trichlorophenoxy acetic acid)
Disulfoton	2,4,5-TP [2-(2,4,5-Trichlorophenoxy) propanoic acid]
Diuron	Trichlorofan
Epichlorohydrin	Triethylamine
Ethanolamine	Trimethylamine
Ethion	Uranium
Ethylene diamine	Vandium
Ethylene dibromide	Vinyl Acetate
Formaldehyde	Xylene
Furfural	Xylenol
Guthion	Zirconium

APPENDIX B – FLOODPLAIN INFORMATION

NOTES TO USERS

This map is for use in administering the National Flood Insurance Program. It does not necessarily identify all areas subject to flooding, particularly from local drainage sources of small size. The community map repository should be consulted for possible updated or additional flood hazard information.

To obtain more detailed information in areas where **Base Flood Elevations (BFEs)** and/or **floodways** have been determined, users are encouraged to consult the Flood Profiles and Floodway Data and/or Summary of Stillwater Elevations tables contained within the Flood Insurance Study (FIS) report that accompanies this FIRM. Users should be aware that BFEs shown on the FIRM represent rounded whole-foot elevations. These BFEs are intended for flood insurance rating purposes only and should not be used as the sole source of flood elevation information. Accordingly, flood elevation data presented in the FIS report should be utilized in conjunction with the FIRM for purposes of construction and/or floodplain management.

Coastal Base Flood Elevations shown on this map apply only landward of 0.0' North American Vertical Datum of 1988 (NAVD 88). Users of this FIRM should be aware that coastal flood elevations are also provided in the Summary of Stillwater Elevations table in the Flood Insurance Study report for this jurisdiction. Elevations shown in the Summary of Stillwater Elevations table should be used for construction and/or floodplain management purposes when they are higher than the elevations shown on this FIRM.

Boundaries of the **floodways** were computed at cross sections and interpolated between cross sections. The floodways were based on hydraulic considerations with regard to requirements of the National Flood Insurance Program. Floodway widths and other pertinent floodway data are provided in the Flood Insurance Study report for this jurisdiction.

Certain areas not in Special Flood Hazard Areas may be protected by **flood control structures**. Refer to Section 2.4 "Flood Protection Measures" of the Flood Insurance Study report for information on flood control structures for this jurisdiction.

The **projection** used in the preparation of this map was Colorado State Plane north zone (FIPSZONE 0501). The **horizontal datum** was NAD83, GRS1980 spheroid. Differences in datum, spheroid, projection or State Plane zones used in the production of FIRMs for adjacent jurisdictions may result in slight positional differences in map features across jurisdiction boundaries. These differences do not affect the accuracy of the FIRM.

Flood elevations on this map are referenced to the North American Vertical Datum of 1988. These flood elevations must be compared to structure and ground elevations referenced to the same **vertical datum**. For information regarding conversion between the National Geodetic Vertical Datum of 1989 and the North American Vertical Datum of 1988, visit the National Geodetic Survey website at <http://www.ngs.noaa.gov/> or contact the National Geodetic Survey at the following address:

NGS Information Services
NOAA, N/NGS12
National Geodetic Survey
SSMCO-3, #9202
1315 East-West Highway
Silver Spring, MD 20910-3282

To obtain current elevation, description, and/or location information for **bench marks** shown on this map, please contact the Information Services Branch of the National Geodetic Survey at (301) 713-3242, or visit its website at <http://www.ngs.noaa.gov/>.

Base map information on this FIRM was provided by the Larimer County GIS and Mapping Department. Additional input was provided by the City of Fort Collins Geographic Information Services Division. These Data are current as of 2010.

This map reflects more detailed and up-to-date **stream channel configurations** than those shown on the previous FIRM for this jurisdiction. The floodplains and floodways that were transferred from the previous FIRM may have been adjusted to conform to these new stream channel configurations. As a result, the Flood Profiles and Floodway Data tables in the Flood Insurance Study report (which contains authoritative hydraulic data) may reflect stream channel distances that differ from what is shown on this map.

Corporate limits shown on this map are based on the best data available at the time of publication. Because changes due to annexations or de-annexations may have occurred after this map was published, map users should contact appropriate community officials to verify current corporate limit locations.

Please refer to the separately printed **Map Index** for an overview map of the county showing the layout of map panels; community map repository addresses; and a Listing of Communities table containing National Flood Insurance Program dates for each community as well as a listing of the panels on which each community is located.

For information and questions about this map, available products associated with this FIRM including historic versions of this FIRM, how to order products or the National Flood Insurance Program in general, please call the FEMA Map Information eXchange at 1-877-FEMA-MAP (1-877-336-6327) or visit the FEMA Map Service Center website at <http://mfc.fema.gov>. Available products may include previously issued Letters of Map Change, a Flood Insurance Study Report, and/or digital versions of this map. Many of these products can be ordered or obtained directly from the website. Users may determine the current map date for each FIRM panel by visiting the FEMA Map Service Center website or by calling the FEMA Map Information eXchange.

LEGEND

SPECIAL FLOOD HAZARD AREAS (SFHAs) SUBJECT TO FLOODING BY THE 1% ANNUAL CHANCE FLOOD

- The 1% annual chance flood (100-year flood), also known as the base flood, is the flood that has a 1% chance of being equaled or exceeded in any given year. The Special Flood Hazard Area is the area subject to flooding by the 1% annual chance flood. Areas of Special Flood Hazard include Zones A, AE, AH, AO, AV, X, and VE. The Base Flood Elevation is the water surface elevation of the 1% annual chance flood.
- ZONE A** No Base Flood Elevations determined.
- ZONE AE** Base Flood Elevations determined.
- ZONE AH** Flood depths of 1 to 3 feet (usually areas of ponding); Base Flood Elevations determined.
- ZONE AO** Flood depths of 1 to 3 feet (usually sheet flow on sloping terrain); average depths determined. For areas of shallow fan flooding, velocities also determined.
- ZONE AV** Special Flood Hazard Area formerly protected from the 1% annual chance flood by a flood control system that was subsequently decertified. Zone AV indicates that the former flood control system is being restored to provide protection from the 1% annual chance or greater flood.
- ZONE AV99** Area to be protected from 1% annual chance flood by a Federal flood protection system under construction; no Base Flood Elevations determined.
- ZONE V** Coastal flood zone with velocity hazard (wave action); no Base Flood Elevations determined.
- ZONE VE** Coastal flood zone with velocity hazard (wave action); Base Flood Elevations determined.

FLOODWAY AREAS IN ZONE AE

The floodway is the channel of a stream plus any adjacent floodplain areas that must be kept free of encroachment so that the 1% annual chance flood can be carried without substantial increases in flood heights.

OTHER FLOOD AREAS

- ZONE X** Areas of 0.2% annual chance flood; areas of 1% annual chance flood with average depths of less than 1 foot or with drainage areas less than 1 square mile; and areas protected by levees from 1% annual chance flood.
- ZONE D** Areas determined to be outside the 0.2% annual chance floodplain.
- ZONE D** Areas in which flood hazards are undetermined, but possible.

COASTAL BARRIER RESOURCES SYSTEM (CBRS) AREAS

OTHERWISE PROTECTED AREAS (OPAs)

CBRS areas and OPAs are normally located within or adjacent to Special Flood Hazard Areas.

- Floodplain boundary
- Floodway boundary
- Zone D boundary
- CBRS and OPA boundary
- Boundary dividing Special Flood Hazard Areas of different Base Flood Elevations, flood depths or flood velocities.
- Base Flood Elevation line and value; elevation in feet*
- Base Flood Elevation value where uniform within zone; elevation in feet
- Cross section line
- Transect line
- Geographic coordinates referenced to the North American Datum of 1983 (NAD 83)
- 1000-meter Universal Transverse Mercator grid ticks, zone 13
- 5000-foot grid ticks: Colorado State Plane coordinate system, north zone (FIPSZONE 0501), Lambert Conformal Conic
- Bench mark (see explanation in Notes to Users section of this FIRM panel)
- River Mile

* Referenced to the North American Vertical Datum of 1988 (NAVD 88)

Refer to Map Repositories list on Map Index

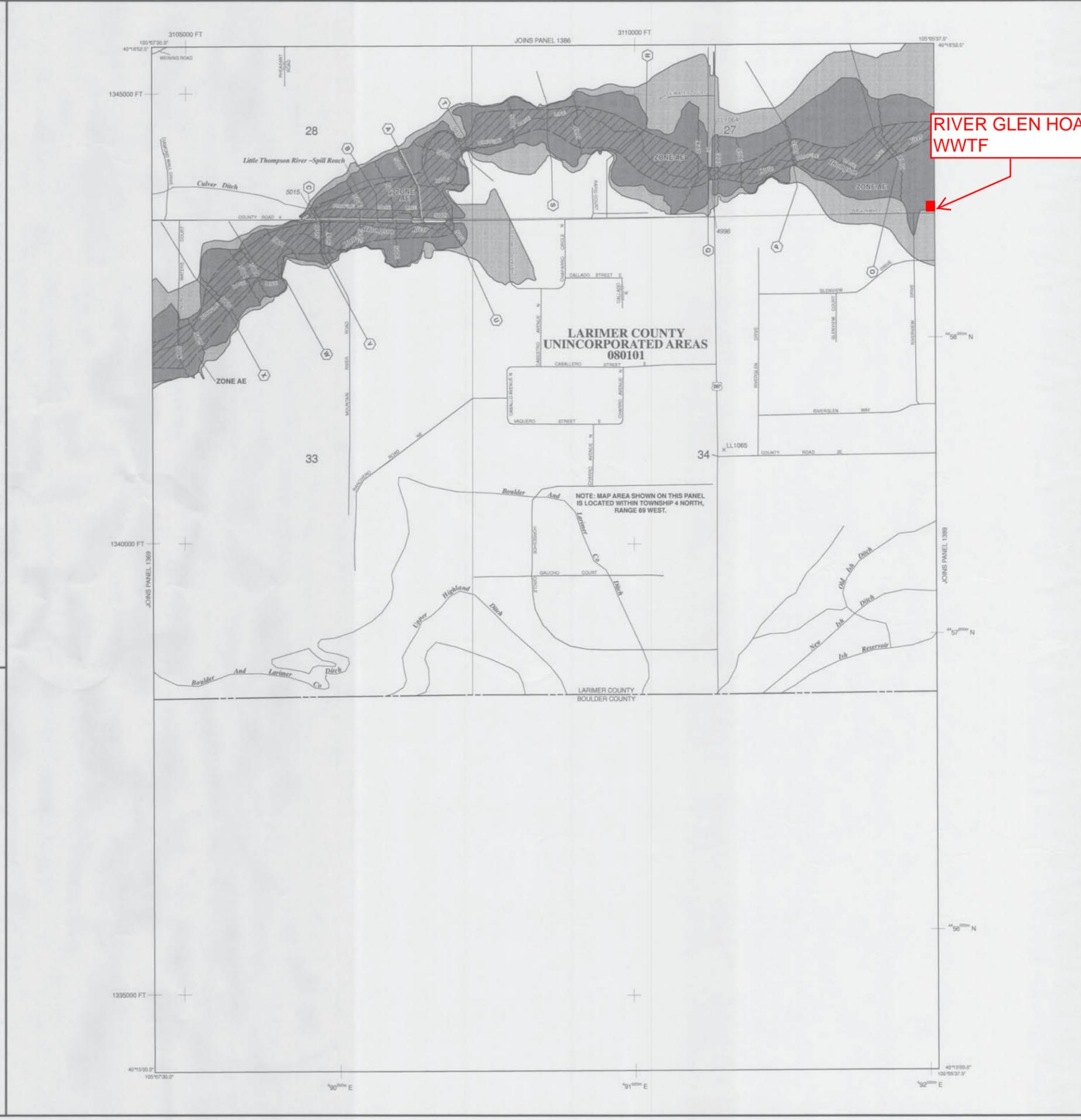
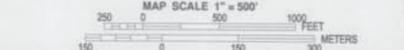
EFFECTIVE DATE OF COUNTYWIDE FLOOD INSURANCE RATE MAP

EFFECTIVE DATE(S) OF REVISION(S) TO THIS PANEL

to change Special Flood Hazard Areas, to add roads and road names, to add floodway, to advance rule, and to add Base Flood Elevation.

For community map revision history prior to countywide mapping, refer to the Community Map History table located in the Flood Insurance Study report for this jurisdiction.

To determine if flood insurance is available in this community, contact your insurance agent or call the National Flood Insurance Program at 1-800-638-6632.



RIVER GLEN HOA WWTF

LARIMER COUNTY UNINCORPORATED AREAS 080101

NOTE: MAP AREA SHOWN ON THIS PANEL IS LOCATED WITHIN TOWNSHIP 4 NORTH, RANGE 69 WEST.

NATIONAL FLOOD INSURANCE PROGRAM

PANEL 1388G

FIRM FLOOD INSURANCE RATE MAP

LARIMER COUNTY, COLORADO AND INCORPORATED AREAS

PANEL 1388 OF 1420
(SEE MAP INDEX FOR FIRM PANEL LAYOUT)

CONTAINS:	NUMBER	PANEL	SUFFIX
LARIMER COUNTY	080101	1388	G

PRELIMINARY
JULY 14, 2011

Notice to User: The Map Number shown below should be used when placing map orders; the Community Number shown above should be used on insurance applications for the subject community.

MAP NUMBER 08069C1388G
MAP REVISED

Federal Emergency Management Agency

APPENDIX C – EXISTING AND PROJECTED FLOW CONDITIONS

1. Existing Wastewater Flow Calculations
2. Projected Wastewater Flow and Loading Calculations



JVA, Incorporated
 1319 Spruce Street
 Boulder, CO 80302
 Ph: 303.444.1951
 Fax: 303.444.1957

Job Name: River Glen HOA WWTF
 Job Number: 1862.1c
 Date: 4/16/2012
 By: BLM

**Wastewater Flows
 From River Glen HOA WWTF**

Month	Monthly Wastewater Flow (Gal)	Average Daily Wastewater Flow (gpd)	Peak Day Wastewater Flow (gpd)	Estimated Daily Per Capita Wastewater Flow** (gpcd)
January, 2008	465,000	15,000	26,000	93
February	378,000	13,500	17,300	83
March	465,000	15,000	28,000	93
April	480,000	16,000	26,000	99
May*	434,000	14,000	19,000	86
June*	450,000	15,000	29,000	93
July*	744,000	24,000	29,000	148
August*	434,000	14,000	22,000	86
September*	570,000	19,000	29,000	117
October	372,000	12,000	17,000	74
November	390,000	13,000	21,000	80
December	345,340	11,140	14,700	69
January, 2009	403,000	13,000	16,000	80
February	364,000	13,000	17,000	80
March	403,000	13,000	20,000	80
April	420,000	14,000	16,000	86
May*	412,300	13,300	15,000	82
June*	498,000	16,600	17,600	102
July*	868,000	28,000	31,000	173
August*	--	--	--	--
September*	--	--	--	--
October	--	--	--	--
November	--	--	--	--
December	--	--	--	--
January, 2010	--	--	--	--
February	--	--	--	--
March	527,000	17,000	18,000	105
April	690,000	23,000	28,000	142
May*	434,000	14,000	28,000	86
June*	--	--	--	--
July*	--	--	--	--
August*	465,000	15,000	28,000	93
September*	420,000	14,000	20,000	86
October	403,000	13,000	31,000	80
November	570,000	19,000	25,000	117
December	--	--	--	--
Average	477,102	15,675	22,638	97

****Per Capita Flows are based on current number of residents, 162.**

	<u>Value</u>	<u>Unit</u>
Number of Houses in Existing System =	68	Houses
2010 Census Avg. Household Size (Berthoud) =	2.52	people per household [2010 Census]
Peak Day Peaking Factor =	1.47	[Max Daily Flow / Average Daily Flow]
Maximum Month Peaking Factor =	1.23	[Maximum Month Average/ Average Daily Flow]
Average Per Capita Flow =	97	GPD



JVA, Incorporated
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 Fax: 303.444.1957

Job Name: River Glen HOA WWTF
 Job Number: 1862.1c
 Date: 11/23/2012
 By: BLM

**Projected Wastewater Flows
 River Glen HOA WWTF**

Year	EQRs	Population	Average Daily Flow (gpd)	Max Month Flow (gpd)	Peak Day Flow (gpd)	Peak Hour Flow (gpd)	BOD Load (lbs BOD/day)	TSS Load (lbs TSS/day)	N Load (lbs N/day)	P Load (lbs P/day)
2012	68	170	15,300	19,125	22,950	61,200	31.9	32.3	3.8	0.9
2013	68	171	15,384	19,230	23,076	61,537	32.1	32.5	3.8	0.9
2014	69	172	15,469	19,336	23,203	61,875	32.3	32.6	3.9	0.9
2015	69	173	15,554	19,442	23,331	62,215	32.4	32.8	3.9	0.9
2016	70	174	15,639	19,549	23,459	62,558	32.6	33.0	3.9	0.9
2017	70	175	15,725	19,657	23,588	62,902	32.8	33.2	3.9	0.9
2018	70	176	15,812	19,765	23,718	63,248	33.0	33.4	4.0	0.9
2019	71	177	15,899	19,874	23,848	63,595	33.1	33.5	4.0	0.9
2020	71	178	15,986	19,983	23,979	63,945	33.3	33.7	4.0	0.9
2021	71	179	16,074	20,093	24,111	64,297	33.5	33.9	4.0	0.9
2022	72	180	16,163	20,203	24,244	64,651	33.7	34.1	4.0	0.9
2023	72	181	16,252	20,314	24,377	65,006	33.9	34.3	4.1	0.9
2024	73	182	16,341	20,426	24,511	65,364	34.1	34.5	4.1	1.0
2025	73	183	16,431	20,538	24,646	65,723	34.3	34.7	4.1	1.0
2026	73	184	16,521	20,651	24,782	66,085	34.4	34.9	4.1	1.0
2027	74	185	16,612	20,765	24,918	66,448	34.6	35.1	4.2	1.0
2028	74	186	16,703	20,879	25,055	66,814	34.8	35.2	4.2	1.0
2029	75	187	16,795	20,994	25,193	67,181	35.0	35.4	4.2	1.0
2030	75	188	16,888	21,110	25,331	67,551	35.2	35.6	4.2	1.0
2031	75	189	16,981	21,226	25,471	67,922	35.4	35.8	4.2	1.0
2032	76	190	17,074	21,342	25,611	68,296	35.6	36.0	4.3	1.0
2033	76	191	17,168	21,460	25,752	68,671	35.8	36.2	4.3	1.0
Buildout	110	275	24,750	30,938	37,125	99,000	51.6	52.2	6.2	1.4

	<u>Value</u>	<u>Unit</u>
Annual Growth Rate =	0.55	Percent
Population Density =	2.50	People per Household
Average Per Capita Flow =	90	GPD
Maximum Month Peaking Factor =	1.25	
Peak Day Peaking Factor =	1.5	
Peak Hour Peaking Factor =	4	
Influent BOD concentration =	250	mg/L
Influent TSS concentration =	253	mg/L
Influent N concentration =	30	mg/L
Influent P concentration =	7	mg/L

APPENDIX D – HISTORICAL WASTEWATER QUALITY DATA

1. Wastewater Quality Data (DMR Summary)



JVA, Incorporated
 1319 Spruce Street
 Boulder, CO 80302
 Ph: 303.444.1951
 Fax: 303.444.1957

Job Name: River Glen HOA WWTF
 Job Number: 1862.1c
 Date: 4/16/2012
 By: BLM

MONTH	RIVER GLEN HOA WWTF - INFLUENT FLOWS									
	30-DAY AVERAGE (MGD)					DAILY MAXIMUM (MGD)				
	2008	2009	2010	2011	AVG	2008	2009	2010	2011	AVG
JANUARY	0.0150	0.0130	NODI C	0.0290	0.0140	0.0260	0.0160	NODI C	0.030	0.0210
FEBRUARY	0.0135	0.0130	NODI C	0.0190	0.0133	0.0173	0.0170	NODI C	0.020	0.0172
MARCH	0.0150	0.0130	0.017	0.0410	0.0215	0.0280	0.0200	0.018	0.052	0.0295
APRIL	0.0160	0.0140	0.023	-	0.0177	0.0260	0.0160	0.028	-	0.0233
MAY	0.0140	0.0133	0.014	-	0.0138	0.0190	0.0150	0.028	-	0.0207
JUNE	0.0150	0.0166	NODI C	-	0.0158	0.0290	0.0176	NODI C	-	0.0233
JULY	0.0240	0.0280	NODI C	-	0.0260	0.0290	0.0310	NODI C	-	0.0300
AUGUST	0.0140	NODI C	0.015	-	0.0145	0.0220	NODI C	0.028	-	0.0250
SEPTEMBER	0.0190	NODI C	0.014	-	0.0165	0.0290	NODI C	0.020	-	0.0245
OCTOBER	0.0120	NODI C	0.013	-	0.0125	0.0170	NODI C	0.031	-	0.0240
NOVEMBER	0.0130	NODI C	0.019	-	0.0160	0.0210	NODI C	0.025	-	0.0230
DECEMBER	0.0114	NODI C	NODI C	-	0.0114	0.0147	NODI C	NODI C	-	0.0147
ANNUAL TOTAL	0.1819	-	-	-	0.016	-	-	-	-	0.276

MONTH	RIVER GLEN HOA WWTF				
	pH MAX				
	2008	2009	2010	2011	AVG
JANUARY	8.7	7.8	NODI C	7.7	8.3
FEBRUARY	8.1	7.8	NODI C	7.6	8.0
MARCH	8.7	8.2	7.5	7.8	8.1
APRIL	8.6	8.4	8.6	-	8.5
MAY	8.5	8.3	7.4	-	8.1
JUNE	8.3	8.7	NODI C	-	8.5
JULY	8.3	8.2	NODI C	-	8.3
AUGUST	8.3	NODI C	7.8	-	8.1
SEPTEMBER	9.0	NODI C	7.5	-	8.3
OCTOBER	8.3	NODI C	7.6	-	8.0
NOVEMBER	8.4	NODI C	7.8	-	8.1
DECEMBER	8.1	NODI C	NODI C	-	8.1
ANNUAL AVG	8.4	-	-	-	8.2

RIVER GLEN HOA WWTF - TSS																				
MONTH	RIVER GLEN HOA WWTF - INFLUENT TSS					RIVER GLEN HOA WWTF - EFFLUENT TSS														
	30 DAY AVG (mg/L)					30 DAY AVERAGE (mg/L)					7 DAY AVERAGE (mg/L)					% REMOVAL				
	2008	2009	2010	2011	AVG	2008	2009	2010	2011	AVG	2008	2009	2010	2011	AVG	2008	2009	2010	2011	AVG
JANUARY	245	160	NODI C	274	203	21	35	NODI C	29	28	21	35	NODI C	29	28.0	91	78	NODI C	89	84.8
FEBRUARY	123	330	NODI C	380	227	18	47	NODI C	33	33	18	47	NODI C	33	32.5	85	86	NODI C	91	85.6
MARCH	170	383	99	517	292	16	31	16	78	35	16	31	16	78	35.3	91	92	84	85	87.8
APRIL	150	773	332	-	418	62	68	26	-	52	62	90	26	-	59.3	59	91	92	-	80.7
MAY	135	300	155	-	197	63	16	13	-	31	132	16	13	-	53.7	53	95	92	-	79.9
JUNE	113	313	NODI C	-	213	15	54	NODI C	-	35	15	54	NODI C	-	34.5	87	83	NODI C	-	84.7
JULY	133	147	NODI C	-	140	0	17	NODI C	-	9	0	75	NODI C	-	37.5	100	88	NODI C	-	94.2
AUGUST	250	NODI C	177	-	214	23	NODI C	10	-	17	23	NODI C	10	-	16.5	91	NODI C	94	-	92.6
SEPTEMBER	240	NODI C	240	-	240	45	NODI C	10.5	-	28	45	NODI C	10.5	-	27.8	81	NODI C	96	-	88.4
OCTOBER	170	NODI C	424	-	297	23	NODI C	9.5	-	16	23	NODI C	9.5	-	16.3	86	NODI C	98	-	92.1
NOVEMBER	130	NODI C	212	-	171	46	NODI C	9.5	-	28	46	NODI C	9.5	-	27.8	65	NODI C	96	-	80.1
DECEMBER	260	NODI C	NODI C	-	260	31	NODI C	NODI C	-	31	31	NODI C	NODI C	-	31.0	88	NODI C	NODI C	-	88.1
ANNUAL AVG	176.6	-	-	-	239.2	30.3	-	-	-	28.4	36.0	-	-	-	33.3	81.4	-	-	-	86.6



JVA, Incorporated
 1319 Spruce Street
 Boulder, CO 80302
 Ph: 303.444.1951
 Fax: 303.444.1957

Job Name: River Glen HOA WWTF
 Job Number: 1862.1c
 Date: 4/16/2012
 By: BLM

MONTH	RIVER GLEN HOA WWTF - INFLUENT BOD									
	30 DAY AVG (mg/L)					ORGANIC LOAD (lbs BOD/day)				
	2008	2009	2010	2011	AVG	2008	2009	2010	2011	AVG
JANUARY	380	166	NODI C	182	273	47.5	18.0	NODI C	44.0	32.8
FEBRUARY	218	162	NODI C	318	190	24.5	17.6	NODI C	50.4	21.1
MARCH	211	237	120	256	206	26.4	25.7	17.0	87.5	39.2
APRIL	184	420	116	-	240	24.6	49.0	22.3	-	31.9
MAY	264	166	186	-	205	30.8	18.4	21.7	-	23.7
JUNE	196	173	NODI C	-	185	24.5	24.0	NODI C	-	24.2
JULY	137	175	NODI C	-	156	27.4	40.9	NODI C	-	34.1
AUGUST	122	NODI C	92	-	107	14.2	NODI C	11.5	-	12.9
SEPTEMBER	220	NODI C	97	-	159	34.9	NODI C	11.3	-	23.1
OCTOBER	130	NODI C	471	-	301	13.0	NODI C	51.1	-	32.0
NOVEMBER	175	NODI C	186	-	181	19.0	NODI C	29.5	-	24.2
DECEMBER	220	NODI C	NODI C	-	220	20.9	NODI C	NODI C	-	20.9
ANNUAL AVG	204.8	-	-	-	201.8	25.7	-	-	-	26.7

MONTH	RIVER GLEN HOA WWTF -EFFLUENT BOD														
	30 DAY AVG (mg/L)					7 DAY AVG (mg/L)					% REMOVAL				
	2008	2009	2010	2011	AVG	2008	2009	2010	2011	AVG	2008	2009	2010	2011	AVG
JANUARY	0	30	NODI C	45	15	0	31	NODI C	45	15.5	100	82	NODI C	85	91.0
FEBRUARY	17	20	NODI C	6	19	17	20	NODI C	6	18.5	92	88	NODI C	98	90.0
MARCH	22	23	5	27	19	22	23	5	27	19.3	89	30	95	89	75.8
APRIL	21	28	19	-	23	42	45	19	-	35.3	88	100	85	-	91.0
MAY	49	13	5	-	22	69	13	5	-	29.0	76	92	96	-	88.0
JUNE	0	13	NODI C	-	7	0	13	NODI C	-	6.5	100	92	NODI C	-	96.0
JULY	19	12	NODI C	-	16	19	12	NODI C	-	15.5	86	93	NODI C	-	89.5
AUGUST	8	NODI C	21	-	15	8	NODI C	21	-	14.5	93	NODI C	88	-	90.5
SEPTEMBER	20	NODI C	14	-	17	20	NODI C	14	-	17.0	91	NODI C	85	-	88.0
OCTOBER	17	NODI C	5	-	11	17	NODI C	5	-	11.0	87	NODI C	97	-	92.0
NOVEMBER	21	NODI C	5	-	13	21	NODI C	5	-	13.0	88	NODI C	97	-	92.5
DECEMBER	26	NODI C	NODI C	-	26	26	NODI C	NODI C	-	26.0	88	NODI C	NODI C	-	88.0
ANNUAL AVG	18.3	-	-	-	16.8	21.8	-	-	-	18.4	89.8	-	-	-	89.4



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Job Name: River Glen HOA WWTF

Job Number: 1862.1c

Date: 4/16/2012

By: BLM

MONTH	RIVER GLEN HOA WWTF - AMMONIA (AS TOTAL N)											
	30 DAY AVG (mg/L)						DAILY MAX (mg/L)					
	2017 LIMITS	2008	2009	2010	2011	AVG	2017 LIMITS	2008	2009	2010	2011	AVG
JANUARY	5.1	44.4	40.4	NODI C	29.6	42.4	12	44.4	40.4	NODI C	29.6	42.4
FEBRUARY	5.1	49.0	32.3	NODI C	30.8	40.7	12	49.0	32.3	NODI C	30.8	40.7
MARCH	3.5	34.0	3.6	30.0	28.4	24.0	8	34.0	3.6	30.0	28.4	24.0
APRIL	1.7	19.1	23.2	15.3	-	19.2	6	19.1	23.2	15.3	-	19.2
MAY	2.8	9.8	20.8	93.0	-	41.2	12	9.8	20.8	93.0	-	41.2
JUNE	1.7	12.8	35.2	NODI C	-	24.0	8	12.8	35.2	NODI C	-	24.0
JULY	1.9	23.0	0.6	NODI C	-	11.8	12	23.0	0.6	NODI C	-	11.8
AUGUST	2.8	4.9	NODI C	3.1	-	4.0	19	4.9	NODI C	3.1	-	4.0
SEPTEMBER	2.2	1.9	NODI C	3.5	-	2.7	12	1.9	NODI C	3.5	-	2.7
OCTOBER	3.5	8.6	NODI C	0.9	-	4.8	17	8.6	NODI C	0.9	-	4.8
NOVEMBER	3.8	15.8	NODI C	0.9	-	8.4	12	15.8	NODI C	0.9	-	8.4
DECEMBER	4.9	25.9	NODI C	NODI C	-	25.9	12	25.9	NODI C	NODI C	-	25.9
ANNUAL AVG		20.8	-	-	-	20.7		20.8	-	-	-	20.7

MONTH	RIVER GLEN HOA WWTF - CHLORINE RESIDUAL											
	30 DAY AVG (mg/L)						INSTANT MAX (mg/L)					
	2017 LIMITS	2008	2009	2010	2011	AVG	2017 LIMITS	2008	2009	2010	2011	AVG
JANUARY	0.011	2.7	0.3	NODI C	0.7	1.5	0.019	0.5	0.5	NODI C	0.5	0.5
FEBRUARY	0.011	0.4	0.3	NODI C	0.3	0.3	0.019	0.5	0.5	NODI C	0.5	0.5
MARCH	0.011	0.0	0.2	0.3	0.3	0.2	0.019	0.5	0.5	0.5	0.5	0.5
APRIL	0.011	0.3	0.4	0.5	-	0.4	0.019	0.5	0.5	0.5	-	0.5
MAY	0.011	0.3	0.4	0.3	-	0.3	0.019	0.5	0.5	0.4	-	0.5
JUNE	0.011	4.5	0.2	NODI C	-	2.4	0.019	0.5	0.5	NODI C	-	0.5
JULY	0.011	2.5	0.2	NODI C	-	1.4	0.019	0.5	0.5	NODI C	-	0.5
AUGUST	0.011	3.3	NODI C	0.4	-	1.9	0.019	0.5	NODI C	0.5	-	0.5
SEPTEMBER	0.011	0.2	NODI C	0.5	-	0.4	0.019	0.5	NODI C	0.5	-	0.5
OCTOBER	0.011	2.3	NODI C	0.4	-	1.4	0.019	0.5	NODI C	0.5	-	0.5
NOVEMBER	0.011	0.4	NODI C	0.4	-	0.4	0.019	0.5	NODI C	0.5	-	0.5
DECEMBER	0.011	0.3	NODI C	NODI C	-	0.3	0.019	0.5	NODI C	NODI C	-	0.5
ANNUAL AVG		1.4	-	-	-	0.9		0.5	-	-	-	0.5

APPENDIX E – FINANCIAL INFORMATION

1. Expense/Revenue Reports
2. 20-year Cash Flow Projection

River Glen Homeowners Association
Sewer System

Statement of Income and Expense for the Period 1/1/09 – 12/31/09

Dues RGHOA	\$41,769.00
Dues Riverside Farm	<u>1,772.00</u>
	43,541.00
Interest on Collections	<u>20.62</u>
	43,561.62

Wastewater and Treatment Facility Maintenance and Expense:

Operator Compensation	\$ 13,200.00	
Electricity	4,120.93	
Testing and Inspection	2,255.00	
Repair and Maintenance	2,404.47	
Chemicals	622.36	
C.D.H. Permit	525.00	
Water	<u>333.16</u>	23,460.92

General Expense:

Mosquito Control	\$ 5,750.00	
Insurance	<u>764.99</u>	
Accounting (Kirkland & Co.)	600.00	
Office Supplies, Postage, etc.	635.39	
Miscellaneous	<u>422.10</u>	8,172.48

Sludge Removal	14,783.00	
Inventron Flow Meter	2,647.00	
Remove Concrete Flow Control Box	879.20	
New Clorox Pump	838.65	
Aquarian Aerator	609.54	
Compaxial Blower/canister/Protector Covers	<u>642.08</u>	<u>20,399.47</u>

Total 52,032.87

Expenditures Over Receipts (\$8,471.25)

River Glen Homeowners Association
Sewer System
Statement of Income and Expense for the Period 1/1/2010 - 12/31/2010

Dues Received, RGHOA		\$49,828.25
Less: Dues allocated to irrigation (4 X \$650.00 per quarter)		2,600.00
		\$47,228.25

Dues Received, Riverside Farm	\$ 3,942.20	
Interest on Collections (RGHOA)	26.00	
		3,968.20

Total Collections		51,196.45
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Sewer Treatment and Maintenance Expense:

Operator Compensation	\$ 15,000.00		
Electricity	5,122.80		
Repair and Maintenance	1,441.48		
Testing and Inspection	1,656.00		
Chemicals	650.33		
C.D.H. Permit	525.00		
Mowing	650.00		
Water	316.88		
			25,362.49

General Expense:

Mosquito Control	5,925.00		
Insurance	747.00		
Accounting (Kirkland & Co.)	540.00		
RGHOA Ground Maintenance	392.40		
Miscellaneous	203.00		
Office Supplies	508.10		
			8,315.50

Non-recurring Items:

Pipe Cleaning (RGHOA)	3,033.80		
C.D.H. Dechlorination System Approval	1,345.00		
Safety Equipment	4,489.82		
Two Aerator Motors	1,746.20		
			10,614.82

44,292.81

Receipts Over Expenditures		\$ 6,903.64
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River Glen Homeowners Association
 STATEMENT ONE
 Sewer System
 Statement of Income and Expense for the Period 1/1/2011 - 12/31/2011

Dues Received, RGHOA		\$47,157.28
Less: Dues allocated to irrigation (4 X \$650.00 per quarter)		2,600.00
		44,557.28

Dues Received, Riverside Farm	\$ 7,395.40	
Interest on Collections (RGHOA)	118.04	
		7,513.44

Total Collections		52,070.72
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Sewer Treatment and Maintenance Expense:		
Operator Compensation	\$ 15,250.00	
Electricity	4,623.16	
Repair and Maintenance	3,445.49	
Testing and Inspection	1,462.00	
Chemicals	1,336.45	
C.D.H. Permit	525.00	
Mowing	650.00	
Water	320.26	
		27,612.36

General Expense:		
Mosquito Control	5,925.00	
Insurance	875.13	
Accounting (Kirkland & Co.)	515.00	
RGHOA Ground Maintenance	999.12	
Miscellaneous	270.00	
Office Supplies	636.38	
Legal	451.50	
		9,672.13

Non-recurring Items:		
Legal Expense, Permit Renewal	2,168.28	
Norweco tablet feeders	856.67	
Contactors for dechlorination	765.77	
Install dechlorinator tanks	1,689.45	
Video inspection of sewer lines	4,196.00	
Aerator Replacement	1,834.59	
		11,510.76
Legal Expense, Wastewater System Upgrade		697.50

		49,492.75
Receipts Over Expenditures		\$ 2,577.97



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Job Name: River Glen HOA - PER
Job Number: 1862c
Date: 11/23/2012
By: BLM

Step 1: Input current user rates

Monthly Residential Base Rate= \$85.39

Notes:

Average of River Glen and Riverside Farms monthly rates, plus \$27.06 base rate for Berthoud fee

Step 2: Input anticipated loan amount

Alternative 1:

Loan Amount = \$ 1,165,000.00
 Interest Rate = 2.0%
 Payment Term (years) = 20
 Yearly Debt Service = \$71,247.58

Step 4: Input Inflation rates and interest rates

Inflation Rate= 2.85%
 Interest Rate= 3.00%

Step 5: Select Coverage Ratio

Coverage Ratio= 1.0

Step 6: Calculate coverage ratios and receive rates - See Loan Calculation Sheet



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20-YEAR CASH FLOW PROJECTIONS (2013 - 2033)

Revenue:

River Glen User Rates
 User fee = \$66.67
 Number of taps = 68
 Total Monthly River Glen Fee = \$4,533.33

Riverside Farms User Rates
 User fee = \$50.00
 Number of active taps = 18
 Undeveloped Lot Fee = \$18.00
 Number of undeveloped platted lots = 0
 Total Monthly Riverside Farms Fee = \$900.00

Berthoud Base Connection Fee = \$27.06
 Number of Platted Lots = 86

Revenue:	Budget 2012																				
	2012	2013	2014	2015	2016	2017	2018	2019	2020	2021	2022	2023	2024	2025	2026	2027	2028	2029	2030	2031	2032
River Glen User Fees	\$54,400	\$55,950	\$57,545	\$59,185	\$60,872	\$62,607	\$64,391	\$66,226	\$68,114	\$70,055	\$72,051	\$74,105	\$76,217	\$78,389	\$80,623	\$82,921	\$85,284	\$87,715	\$90,214	\$92,786	\$95,430
Riverside Farms Use Fees	\$10,800	\$11,108	\$11,424	\$11,750	\$12,085	\$12,429	\$12,783	\$13,148	\$13,523	\$13,908	\$14,304	\$14,712	\$15,131	\$15,563	\$16,006	\$16,462	\$16,931	\$17,414	\$17,910	\$18,421	\$18,946
Monthly Fees for Berthoud Connection	\$2,327	\$2,393	\$2,462	\$2,532	\$2,604	\$2,678	\$2,755	\$2,833	\$2,914	\$2,997	\$3,082	\$3,170	\$3,260	\$3,353	\$3,449	\$3,547	\$3,648	\$3,752	\$3,859	\$3,969	\$4,082
Total Revenues	\$67,527	\$69,452	\$71,431	\$73,467	\$75,561	\$77,714	\$79,929	\$82,207	\$84,550	\$86,960	\$89,438	\$91,987	\$94,608	\$97,305	\$100,078	\$102,930	\$105,864	\$108,881	\$111,984	\$115,176	\$118,458

Expenditures:

Berthoud WWTF Fees	\$43,911	\$45,162	\$46,450	\$47,773	\$49,135	\$50,535	\$51,976	\$53,457	\$54,980	\$56,547	\$58,159	\$59,816	\$61,521	\$63,275	\$65,078	\$66,933	\$68,840	\$70,802	\$72,820	\$74,895	\$77,030
Berthoud O&M Fees	\$5,160	\$5,307	\$5,458	\$5,614	\$5,774	\$5,938	\$6,108	\$6,282	\$6,461	\$6,645	\$6,834	\$7,029	\$7,229	\$7,435	\$7,647	\$7,865	\$8,089	\$8,320	\$8,557	\$8,801	\$9,052
Insurance	\$1,000	\$1,029	\$1,058	\$1,088	\$1,119	\$1,151	\$1,184	\$1,217	\$1,252	\$1,288	\$1,324	\$1,362	\$1,401	\$1,441	\$1,482	\$1,524	\$1,568	\$1,612	\$1,658	\$1,706	\$1,754
Debt Service	\$0	\$71,248	\$71,248	\$71,248	\$71,248	\$71,248	\$71,248	\$71,248	\$71,248	\$71,248	\$71,248	\$71,248	\$71,248	\$71,248	\$71,248	\$71,248	\$71,248	\$71,248	\$71,248	\$71,248	\$71,248
Total Expenditures	\$50,071	\$122,746	\$124,213	\$125,723	\$127,275	\$128,872	\$130,514	\$132,204	\$133,941	\$135,728	\$137,565	\$139,455	\$141,399	\$143,399	\$145,455	\$147,570	\$149,745	\$151,982	\$154,283	\$156,650	\$159,084

Coverage Ratio: 1.00 0.99 0.98 0.96 0.95 0.94 0.93 0.92 0.90 0.89 0.88 0.87 0.86 0.84 0.83 0.82 0.81 0.80 0.78 0.77

	Base Rate	Avg Overage Fee	Rate Increase	Total Average Monthly Rate	No. of Taps	Annual Revenue
Single-Family, 3/4"	\$85.39	\$0.00	\$33.55	\$118.94	86	\$122,746
						Surplus Required = \$0
						Estimated Required Annual Revenue = \$122,746
						Net Annual Revenue = \$122,746

APPENDIX F – OPINION OF PROBABLE COST

1. Opinion of Probable Cost for Alternative 1: SBR (Buildout)
2. Opinion of Probable Cost for Alternative 1: SBR (20-year Planning Period)
3. Opinion of Probable Cost for Alternative 2: Lift Station to Dry Creek (Buildout)
4. Opinion of Probable Cost for Alternative 2: Lift Station to Dry Creek (20-year Planning Period)
5. Opinion of Probable Cost for Alternative 3: Gravity to County Road 15e (Buildout)
6. Opinion of Probable Cost for Alternative 3: Gravity to County Road 15e (20-year Planning Period)
7. Opinion of Probable Cost for Alternative 4: Gravity to Berthoud WWTP (20-year Planning Period and Buildout)
8. Operations and Maintenance Cost Projections



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Job Name: River Glen HOA WWTF PER

Job Number: 1862c

Date: 11/23/2012

By: BLM

Opinion of Probable Costs			
Alternative 1 - Buildout Design			
SBR			
River Glen HOA			
	Quantity	Units	Total
Division - 02 General Sitework			
Clearing and Grubbing	1	LS	\$2,000
Erosion Control	1	LS	\$5,000
Seeding and Landscaping	1	LS	\$5,000
Excavation w/ Dewatering	533	CY	\$30
Force Main (4" HDPE)	636	LF	\$25
Outfall Pipeline	431	LF	\$40
Removal of lagoons and berms: solids disposal	1	LS	\$25,000.00
Removal of lagoons and berms: site grading	2000	CY	\$2.25
General Sitework Subtotal			\$90,600
Division - 03 Concrete			
SBR Process Tanks	120	CY	\$500
Building Slab	10	CY	\$400
Concrete Subtotal			\$63,900
Division - 11 Equipment			
Influent Meter (on Force Main)	1	EA	\$1,700
Influent Mechanical Screening	1	EA	\$45,000
SBR System including Blowers, Valves, Aeration and Controls	1	EA	\$168,000
UV Disinfection	1	LS	\$20,000
Equipment Subtotal			\$293,400
Division - 13 Special Construction			
Insulated Metal Building - (216 SF)	1	LS	\$11,500
Special Construction Subtotal			\$11,700
Division - 15 Mechanical			
HVAC: heater, fans, ventilation	1	LS	\$5,000
Mechanical Subtotal			\$5,000
Division - 16 Electrical			
Electrical	1	LS	\$44,010
Instrumentation and Controls	1	LS	\$29,340
Generator w/ ATS	1	LS	\$30,000
Upgrade to Three Phase Power	1	LS	\$20,000
Electrical Subtotal			\$123,300
Subtotal			\$587,900
Contingency (20%)			\$117,600
Contractor's OH&P (15%)			\$105,800
Permitting, Design And Construction Admin(15%)			\$121,700
Total			\$933,000



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Job Name: River Glen HOA WWTF PER

Job Number: 1862c

Date: 11/23/2012

By: BLM

Opinion of Probable Costs			
Alternative 1 - 20-Year Planning Period			
SBR			
River Glen HOA			
	Quantity	Units	Unit Cost
			Total
Division - 02 General Sitework			
Clearing and Grubbing	1	LS	\$2,000
Erosion Control	1	LS	\$5,000
Seeding and Landscaping	1	LS	\$5,000
Excavation w/ Dewatering	533	CY	\$30
Force Main (4" HDPE)	636	LF	\$25
Outfall Pipeline	431	LF	\$40
Removal of lagoons and berms: solids disposal	1	LS	\$25,000.00
Removal of lagoons and berms: site grading	2000	CY	\$2.25
General Sitework Subtotal			\$90,600
Division - 03 Concrete			
SBR Process Tanks	120	CY	\$500
Building Slab	10	CY	\$400
Concrete Subtotal			\$63,900
Division - 11 Equipment			
Influent Meter (on Force Main)	1	EA	\$1,700
Influent Mechanical Screening	1	EA	\$40,000
SBR System including Blowers, Valves, Aeration and Controls	1	EA	\$150,000
UV Disinfection	1	LS	\$20,000
Equipment Subtotal			\$264,600
Division - 13 Special Construction			
Insulated Metal Building - (216 SF)	1	LS	\$11,500
Special Construction Subtotal			\$11,700
Division - 15 Mechanical			
HVAC: heater, fans, ventilation	1	LS	\$5,000
Mechanical Subtotal			\$5,000
Division - 16 Electrical			
Electrical	1	LS	\$39,690
Instrumentation and Controls	1	LS	\$26,460
Generator w/ ATS	1	LS	\$30,000
Upgrade to Three Phase Power	1	LS	\$20,000
Electrical Subtotal			\$116,200
Subtotal			\$552,000
Contingency (20%)			\$110,400
Contractor's OH&P (15%)			\$99,400
Permitting, Design And Construction Admin(15%)			\$114,300
Total			\$876,100



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Job Name: River Glen HOA WWTF PER
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 By: BLM

**Opinion of Probable Costs
 Alternative 2 - Buildout Design
 Force Main to Dry Creek Connection
 River Glen HOA**

	Quantity	Units	Unit Cost	Total
Division - 02 General Sitework				
Erosion Control	1	LS	\$13,000	\$13,000
Seeding and Landscaping	1	LS	\$3,000	\$3,000
Asphalt Road Patch/Replacement	100	LF	\$15	\$1,500
Force Main (4" HDPE)	5,148	LF	\$25	\$128,700
Sanitary Sewer Line (8" PVC SDR 35)	1,000	LF	\$40	\$40,000
Removal of lagoons and berms: solids disposal	1	LS	\$25,000.00	\$25,000
Removal of lagoons and berms: site grading	2000	CY	\$2.25	\$4,500
General Sitework Subtotal				\$215,700
Division - 03 Concrete				
Manholes	8	EA	\$4,000	\$32,000
Concrete Subtotal				\$32,000
Division - 11 Equipment				
Lift Station Modification: replace pumps, controls, building improvements	1	LS	\$80,000	\$80,000
Equipment Subtotal				\$80,000
Division - 16 Electrical				
Electrical	1	LS	\$8,000	\$8,000
Generator w/ ATS	1	LS	\$15,000	\$15,000
Upgrade to Three Phase Power	1	LS	\$20,000	\$20,000
Electrical Subtotal				\$43,000
Bore				
Directional Drill: Little Thompson River Crossing	100	LF	\$100	\$10,000
Directional Drill: West Country Road 4e	100	LF	\$100	\$10,000
Bore Subtotal				\$20,000
Subtotal				\$390,700
Contingency (20%)			\$78,100	\$78,100
Contractor's OH&P (15%)			\$70,300	\$70,300
Permitting, Design And Construction Admin(15%)			\$80,900	\$80,900
Construction Capital Total				\$620,000
Miscellaneous Costs				
Berthoud WWTF Tap fee	86	EA	\$6,285	\$540,500
Miscellaneous Subtotal				\$540,500
Grand Total				\$1,160,500



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Job Name: River Glen HOA WWTF PER
 Job Number: 1862c
 Date: 11/23/2012
 By: BLM

**Opinion of Probable Costs
 Alternative 2 - 20-Year Planning Period
 Force Main to Dry Creek Connection
 River Glen HOA**

	Quantity	Units	Unit Cost	Total
Division - 02 General Sitework				
Erosion Control	1	LS	\$13,000	\$13,000
Seeding and Landscaping	1	LS	\$3,000	\$3,000
Asphalt Road Patch/Replacement	100	LF	\$15	\$1,500
Force Main (4" HDPE)	5,148	LF	\$25	\$128,700
Sanitary Sewer Line (8" PVC SDR 35)	1,000	LF	\$40	\$40,000
Removal of lagoons and berms: solids disposal	1	LS	\$25,000.00	\$25,000
Removal of lagoons and berms: site grading	2000	CY	\$2.25	\$4,500
General Sitework Subtotal				\$215,700
Division - 03 Concrete				
Manholes	8	EA	\$4,000	\$32,000
Concrete Subtotal				\$32,000
Division - 11 Equipment				
Lift Station Modification: replace pumps, controls, building improvements	1	LS	\$75,000	\$75,000
Equipment Subtotal				\$75,000
Division - 16 Electrical				
Electrical	1	LS	\$7,500	\$7,500
Generator w/ ATS	1	LS	\$15,000	\$15,000
Upgrade to Three Phase Power	1	LS	\$20,000	\$20,000
Electrical Subtotal				\$42,500
Bore				
Directional Drill: Little Thompson River Crossing	100	LF	\$100	\$10,000
Directional Drill: West Country Road 4e	100	LF	\$100	\$10,000
Bore Subtotal				\$20,000
Subtotal				\$385,200
Contingency (20%)			\$77,000	\$77,000
Contractor's OH&P (15%)			\$69,300	\$69,300
Permitting, Design And Construction Admin(15%)			\$79,700	\$79,700
Construction Capital Total				\$611,200
Miscellaneous Costs				
Berthoud WWTF Tap fee	86	EA	\$6,285	\$540,500
Miscellaneous Subtotal				\$540,500
Grand Total				\$1,151,700



JVA, Incorporated
 1319 Spruce Street
 Boulder, CO 80302
 Ph: 303.444.1951
 Fax: 303.444.1957

Job Name: River Glen HOA WWTF PER

Job Number: 1862c

Date: 11/23/2012

By: BLM

Opinion of Probable Costs Alternative 3 - Buildout Design Gravity to Railroad Crossing River Glen HOA			
	Quantity	Units	Total
Division - 02 General Sitework			
Erosion Control	1	LS	\$20,000
Seeding and Landscaping	1	LS	\$10,000
Asphalt Road Patch/Replacement	2,335	LF	\$15
Force Main (4" HDPE)	3,055	LF	\$25
Sanitary Sewer Line (8" PVC SDR 35)	6,832	LF	\$50
Removal of lagoons and berms: solids disposal	1	LS	\$25,000.00
Removal of lagoons and berms: site grading	2000	CY	\$2.25
General Sitework Subtotal			\$512,500
Division - 03 Concrete			
Manholes	29	EA	\$2,500
Concrete Subtotal			\$72,500
Division - 11 Equipment			
New Lift Station - Pumps, Controls, and Building	1	LS	\$120,000
Equipment Subtotal			\$120,000
Division - 15 Mechanical			
Piping, Valves, and Appurtenances	1	LS	\$10,000
Mechanical Subtotal			\$10,000
Division - 16 Electrical			
Electrical	1	LS	\$12,000
Generator w/ ATS	1	LS	\$15,000
Upgrade to Three Phase Power	1	LS	\$20,000
Electrical Subtotal			\$47,000
Bore			
Directional Drill: Little Thompson River Crossing	100	LF	\$100
Directional Drill: Railroad and CR 15 Crossing	200	LF	\$100
Bore Subtotal			\$30,000
Subtotal			\$1,302,500
Contingency (20%)			\$260,500
Contractor's OH&P (15%)			\$234,500
Permitting, Design And Construction Admin(15%)			\$269,600
Construction Capital Total			\$2,067,100
Miscellaneous Costs			
Berthoud WWTF Tap fee	86	EA	\$6,285
Miscellaneous Subtotal			\$540,500
Grand Total			\$2,607,600



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Job Name: River Glen HOA WWTF PER

Job Number: 1862c

Date: 11/23/2012

By: BLM

Opinion of Probable Costs Alternative 3 - 20-Year Planning Period Gravity to Railroad Crossing River Glen HOA				
	Quantity	Units	Unit Cost	Total
Division - 02 General Sitework				
Erosion Control	1	LS	\$20,000	\$20,000
Seeding and Landscaping	1	LS	\$10,000	\$10,000
Asphalt Road Patch/Replacement	2,335	LF	\$15	\$35,000
Force Main (4" HDPE)	3,055	LF	\$25	\$76,400
Sanitary Sewer Line (8" PVC SDR 35)	6,832	LF	\$50	\$341,600
Removal of lagoons and berms: solids disposal	1	LS	\$25,000.00	\$25,000
Removal of lagoons and berms: site grading	2000	CY	\$2.25	\$4,500
General Sitework Subtotal				\$512,500
Division - 03 Concrete				
Manholes	29	EA	\$2,500	\$72,500
Concrete Subtotal				\$72,500
Division - 11 Equipment				
New Lift Station - Pumps, Controls, and Building	1	LS	\$115,000	\$115,000
Equipment Subtotal				\$115,000
Division - 15 Mechanical				
Piping, Valves, and Appurtenances	1	LS	\$10,000	\$10,000
Mechanical Subtotal				\$10,000
Division - 16 Electrical				
Electrical	1	LS	\$11,500	\$11,500
Generator w/ ATS	1	LS	\$15,000	\$15,000
Upgrade to Three Phase Power	1	LS	\$20,000	\$20,000
Electrical Subtotal				\$46,500
Bore				
Directional Drill: Little Thompson River Crossing	100	LF	\$100	\$10,000
Directional Drill: Railroad and CR 15 Crossing	200	LF	\$100	\$20,000
Bore Subtotal				\$30,000
Subtotal				\$1,297,000
			Contingency (20%)	\$259,400
			Contractor's OH&P (15%)	\$233,500
			Permitting, Design And Construction Admin(15%)	\$268,500
Construction Capital Total				\$2,058,400
Miscellaneous Costs				
Berthoud WWTF Tap fee	86	EA	\$6,285	\$540,500
Miscellaneous Subtotal				\$540,500
Grand Total				\$2,598,900



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Job Name: River Glen HOA WWTF PER

Job Number: 1862c

Date: 11/23/2012

By: BLM

Opinion of Probable Costs			
Alternative 4 - Buildout and 20-Year Planning Period			
Gravity to Berthoud WWTF			
River Glen HOA			
	Quantity	Units	Total
Division - 02 General Sitework			
Erosion Control	1	LS	\$30,000
Seeding and Landscaping	1	LS	\$15,000
Asphalt Road Patch/Replacement	200	LF	\$15
Force Main (4" HDPE)	720	LF	\$25
Sanitary Sewer Line (8" PVC SDR 35)	14,755	LF	\$50
Removal of lagoons and berms: solids disposal	1	LS	\$25,000.00
Removal of lagoons and berms: site grading	2000	CY	\$2.25
General Sitework Subtotal			\$822,300
Division - 03 Concrete			
Manholes	44	EA	\$2,500
Concrete Subtotal			\$110,000
Bore			
Directional Drill: Railroad and CR 15 Crossing	300	LF	\$100
Bore Subtotal			\$30,000
Subtotal			\$962,300
Contingency (20%)			\$192,500
Contractor's OH&P (15%)			\$173,200
Permitting, Design And Construction Admin(15%)			\$199,200
Construction Capital Total			\$1,527,200
Miscellaneous Costs			
Berthoud WWTF Tap fee	86	EA	\$6,285
Miscellaneous Subtotal			\$540,500
Grand Total			\$2,067,700



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Job Name: River Glen HOA WWTF PER
 Job Number: 1862c
 Date: 11/23/2012
 By: BLM

Operation & Maintenance Projections

Year	n	Alt 1 SBR		Alt 2 FM to Dry Creek		Alt 3 Grav to RR		Alt 4 Grav to B WWTF	
		Annual Cost	2012 PW	Annual Cost	2012 PW	Annual Cost	2012 PW	Annual Cost	2012 PW
2012	0	\$ 64,600	\$ 64,600	\$ 44,900	\$ 44,900	\$ 44,900	\$ 44,900	\$ 44,900	\$ 44,900
2013	1	\$ 66,100	\$ 64,362	\$ 45,900	\$ 44,693	\$ 45,900	\$ 44,693	\$ 45,900	\$ 44,693
2014	2	\$ 67,600	\$ 64,092	\$ 47,000	\$ 44,561	\$ 47,000	\$ 44,561	\$ 47,000	\$ 44,561
2015	3	\$ 69,200	\$ 63,884	\$ 48,100	\$ 44,405	\$ 48,100	\$ 44,405	\$ 48,100	\$ 44,405
2016	4	\$ 70,800	\$ 63,643	\$ 49,200	\$ 44,227	\$ 49,200	\$ 44,227	\$ 49,200	\$ 44,227
2017	5	\$ 72,400	\$ 63,370	\$ 50,300	\$ 44,027	\$ 50,300	\$ 44,027	\$ 50,300	\$ 44,027
2018	6	\$ 74,000	\$ 63,068	\$ 51,500	\$ 43,892	\$ 51,500	\$ 43,892	\$ 51,500	\$ 43,892
2019	7	\$ 75,700	\$ 62,821	\$ 52,700	\$ 43,734	\$ 52,700	\$ 43,734	\$ 52,700	\$ 43,734
2020	8	\$ 77,500	\$ 62,624	\$ 53,900	\$ 43,554	\$ 53,900	\$ 43,554	\$ 53,900	\$ 43,554
2021	9	\$ 79,300	\$ 62,393	\$ 55,100	\$ 43,353	\$ 55,100	\$ 43,353	\$ 55,100	\$ 43,353
2022	10	\$ 70,900	\$ 54,318	\$ 56,400	\$ 43,209	\$ 56,400	\$ 43,209	\$ 56,400	\$ 43,209
2023	11	\$ 72,600	\$ 54,158	\$ 57,700	\$ 43,043	\$ 57,700	\$ 43,043	\$ 57,700	\$ 43,043
2024	12	\$ 74,200	\$ 53,896	\$ 59,000	\$ 42,856	\$ 59,000	\$ 42,856	\$ 59,000	\$ 42,856
2025	13	\$ 75,900	\$ 53,682	\$ 60,400	\$ 42,719	\$ 60,400	\$ 42,719	\$ 60,400	\$ 42,719
2026	14	\$ 77,700	\$ 53,510	\$ 61,700	\$ 42,491	\$ 61,700	\$ 42,491	\$ 61,700	\$ 42,491
2027	15	\$ 79,500	\$ 53,310	\$ 63,200	\$ 42,380	\$ 63,200	\$ 42,380	\$ 63,200	\$ 42,380
2028	16	\$ 81,300	\$ 53,084	\$ 64,600	\$ 42,180	\$ 64,600	\$ 42,180	\$ 64,600	\$ 42,180
2029	17	\$ 83,200	\$ 52,896	\$ 66,100	\$ 42,025	\$ 66,100	\$ 42,025	\$ 66,100	\$ 42,025
2030	18	\$ 85,100	\$ 52,682	\$ 67,600	\$ 41,848	\$ 67,600	\$ 41,848	\$ 67,600	\$ 41,848
2031	19	\$ 87,000	\$ 52,442	\$ 69,200	\$ 41,713	\$ 69,200	\$ 41,713	\$ 69,200	\$ 41,713
2032	20	\$ 89,000	\$ 52,237	\$ 70,800	\$ 41,555	\$ 70,800	\$ 41,555	\$ 70,800	\$ 41,555
20 Year O&M (2012PW) =			\$ 1,221,000		\$ 907,000		\$ 907,000		\$ 907,000
Salvage Value =			\$ -		\$ -		\$ -		\$ -
Total Present Worth =			\$ 1,221,000		\$ 907,000		\$ 907,000		\$ 907,000

Given:

Energy Cost = \$ 0.09 /kwh

Inflation (I) = 2.30%

Interest (i) = 2.70% The "real" federal discount rate from Appendix C of OMB Circular A-94

Annual Cost = (Sum of costs) × (1 + i)ⁿ

2012 PW = (Annual Cost) × (1 + i)⁻ⁿ

Berthoud WWTF fees:

\$27.06 per month, per connection
 \$6.53 per month, per 1000 gallons

Assume: 86 tap connections 4
 68 active connections 64
 3000 gallons/connection 21
 204,000 total gallons
 204 gallons/1000 gallons

Connection Fee Totals:

\$2,327.16 Per month flat rate for for 86 connections
 \$1,332.12 Per month for 204000 gallons
 \$3,659.28 Total Monthly Fee
 \$43,911.36 Total Annual Fee

	Alt 1 SBR (yr0-10)	Alt 1 SBR (yr10-20)	Alt 2 FM to DC	Alt 3 Grav to RR	Alt 4 Grav to B. WWTF	Notes:
Electricity	\$ 5,600	\$ 7,300	\$ -	\$ -	\$ -	Per manufacturer's ir
Equipment Repairs	\$ 1,000	\$ 1,200	\$ -	\$ -	\$ -	
Insurance	\$ 4,000	\$ 4,000	\$ 1,000	\$ 1,000	\$ 1,000	
Sludge Removal	\$ 2,000	\$ 2,500	\$ -	\$ -	\$ -	
Operator Salary	\$ 25,000	\$ 27,000	\$ -	\$ -	\$ -	
Supplies	\$ 1,000	\$ 1,500	\$ -	\$ -	\$ -	
Chemicals	\$ 3,000	\$ 4,000	\$ -	\$ -	\$ -	
Effluent Testing	\$ 6,000	\$ 6,000	\$ -	\$ -	\$ -	
Annual Replacement Cost	\$ 2,000	\$ 3,000	\$ -	\$ -	\$ -	
Capital Improvement Reserve	\$ 15,000	\$ -	\$ -	\$ -	\$ -	
Berthoud WWTF Fees	\$ -	\$ -	\$ 43,911	\$ 43,911	\$ 43,911	
Berthoud O&M Service Fees (Alt 2-4)	\$ -	\$ -	\$ 5,160	\$ 5,160	\$ 5,160	
Total	\$ 64,600	\$ 56,500	\$ 50,071	\$ 50,071	\$ 50,071	

Berthoud O&M Service Fees (Alt 2 - 4):

\$5.00 per month, per connection
 Assume: 86 tap connections
 68 active connections

Capital Improvement Reserve:

Phosphorus Removal Equipment = \$150,000
 For 10 year period = \$15,000 per year



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Job Name: River Glen HOA WWTF PER
 Job Number: 1862c
 Date: 11/23/2012
 By: BLM

	Alt 1	Alt 1	Alt 2	Alt 3	Alt 4	
Power Consumption Cost Estimate	SBR (yr0-10)	SBR (yr10-20)	FM to DC	Alt 3 Grav to RR	Alt 4 Grav to B. WWTF	Notes:
Total Connected HP Load	-	-	-	-	-	
Equivalent KW						
Hours Per Day Running						
Daily KWh						
Annual KWh	61,916	81,468	8,147	8,147	0	
Annual Power Cost	\$ 5,600.00	\$ 7,300.00	\$ 700.00	\$ 700.00		

Energy Costs

Energy Cost = \$ 0.09 /kwh
 Staffing Cost = \$ 20.00 /hour
 Inflation (I) = 2.70%
 interest (i) = 3.75%

Energy Costs

Energy Cost = \$ 0.09 /kwh
 Staffing Cost = \$ 20.00 /hour
 Inflation (I) = 2.70%
 interest (i) = 3.75%

Energy Costs

Energy Cost = \$ 0.09
 Staffing Cost = \$ 20.00
 Inflation (I) = 2.70%
 interest (i) = 3.75%

Energy Costs

Energy Cost = \$ 0.09
 Staffing Cost = \$ 20.00
 Inflation (I) = 2.70%
 interest (i) = 3.75%

Power Consumption Cost Estimate	Alternative 1 SBR (yr 0-10)	Alternative 1 SBR (yr 10-20)	Power Consumption Cost Estimate	Alternative 2 FM to CR 17	Power Consumption Cost Estimate	Alternative 3 Gravity to RR	Power Consumption Cost Estimate	Alternative 4 Gravity to B. WWTF
Anoxic Mixers			100 gpm/ 60 TDH	Pump - Submersible	100 gpm/ 60 TDH	Pump - Submersible		
Connected HP Load	4	4	Connected HP Load	7.5	Connected HP Load	7.5	Connected HP Load	0
Equivalent kW	3	3	Equivalent kW	6	Equivalent kW	6	Equivalent kW	0
Run Time, hours/day	24	24	Run Time, hours/day	4	Run Time, hours/day	4	Run Time, hours/day	0
Run Time, hours/week	168	168	Run Time, hours/week	28	Run Time, hours/week	28	Run Time, hours/week	0
Energy Load, kWh/yr	26,070	26,070	Energy Load, kWh/yr	8,147	Energy Load, kWh/yr	8,147	Energy Load, kWh/yr	0
Blowers								
Connected HP Load	5	5						
Equivalent kW	4	4						
Run Time, hours/day	12	12						
Run Time, days/week	84	84						
Run Time, hours/week								
Energy Load, kWh/yr	16,294	16,294						
Pump - Jet Motive								
Connected HP Load	5	5						
Equivalent kW	4	4						
Run Time, hours/day	12	12						
Run Time, hours/week	84	84						
Energy Load, kWh/yr	16,294	16,294						
Fractional HP Filter Feed Pumps								
Connected HP Load	0.50	0.50						
Equivalent kW	0	0						
Run Time, hours/day	24	24						
Run Time, hours/week	168	168						
Energy Load, kWh/yr	3,259	3,259						
Pump -Phosphorus Filters								
Connected HP Load	0	3						
Equivalent kW	0	2						
Run Time, hours/day	0	24						
Run Time, hours/week	0	168						
Energy Load, kWh/yr	0	19,552						
Annual kWh	61,916	81,468	Annual kWh	8,147	Annual kWh	8,147	Annual kWh	0
Annual Power Cost	\$5,600	\$7,300	Annual Power Cost	\$700	Annual Power Cost	\$700	Annual Power Cost	\$0

APPENDIX G – FLUIDYNE SBR INFORMATION

1. Fluidyne SBR Information and Quote

FLUIDYNE 
CORPORATION

5436 Nordic Drive, Suite D
Cedar Falls, Iowa 50613
Phone: (319) 266-9967
Fax: (319) 277-6034

Reply to: Fluidyne Florida
2202 Gold Oak Lane
Sarasota, FL 34232
Phone: (941) 342-8915
Fax: (941) 342-9765
E-mail: ptiflorida@aol.com

February 24th, 2012

Leanne Miller
JVA, Incorporated
1319 Spruce Street
Boulder, CO 80302

Re: River Glen HOA WWTP
ISAM™ SBR Process

Gentlemen:

Per the request of Mr. Steve Hansen of Ambiente H₂O, Inc., Fluidyne Corporation is pleased to offer design calculations, layout drawing, and typical specifications, describing a complete ISAM™ Sequencing Batch Reactor process for the above referenced project.

Fluidyne's ISAM™ SBR is ideally suited to this type of small treatment facility. Each flow train of the ISAM™ process consists of a constant level anaerobic selector/trash trap/digester basin, followed by a SAM™ surge basin (influent equalization basin), and one SBR basin. In operation, all influent flow enters the anaerobic basin where influent solids and grit are allowed to settle much like a primary clarifier. The anaerobic chamber eliminates the need for fine screens or grit removal. Additionally, like a primary clarifier, the anaerobic chamber removes a minimum of 30% of the influent BOD, and 65% of the influent solids; this reduces the size of the SBR basins, and the power required for treatment by approximately one third. The influent flow then flows to the SAM™ surge basin. Mixed liquor is maintained in the SAM™ surge basin to immediately react with incoming raw sewage to suppress odors and initiate and accelerate carbon and nitrogen reactions. When the level in the surge basin reaches a predetermined level, the jet motive liquid/fill pump is started, and a batch is quickly fed to the reactor basin. When the SBR basin reaches top water level, mixed liquor overflows the proprietary flow and scum control system weir, and is returned to the SAM™ surge basin via the surge jet, and mixed with incoming wastewater in what is referred to as an "Interact" period. Aeration during the interact period is intermittent, and controlled by cycling the blowers off and on to accomplish complete biodegradation of the wastewater in the SBR. In addition, during the interact phase, nitrates are recycled to the SAM™ tank for effective and rapid

denitrification. Denitrification reactions are accelerated in the presence of the unreacted soluble carbon from the raw sewage entering the SAM™ surge basin. Aeration and energy requirements are reduced as nitrates are fully reduced to nitrogen gas in the SAM™ surge basin.

The positive assurance of anoxic followed by aerobic microbial environments in the Fluidyne ISAM™ system conditions the mixed liquor, encouraging highly flocculent microorganisms with optimal settling, compaction, and dewatering characteristics. Since denitrification takes place in the SAM™ tank the possibility of nitrogen gas bubbles attaching to and floating sludge during the settle cycle is eliminated.

A portion of the motive liquid is also recirculated to the anaerobic chamber where the mixed liquor is converted from an aerobic-dominant population to a facultative-dominant population. Aerobic bacteria are selectively destroyed in while enabling the low-yield, facultative bacteria to breakdown and utilize the remains of the aerobes and their byproducts. The recirculated aerobic mixed liquor also prevents the anaerobic chamber from entering the methane producing mode, and prevents the wide pH swings common to other anaerobic processes. The mixed liquor then flows to the SAM™ surge basin where the facultative bacteria, in turn, are out-competed by the aerobic bacteria and subsequently broken down in the alternating environments of the aerobic SBR treatment process and the anaerobic basin. A steady-state balance between selection and destruction is developed between the anaerobic basin and the SBR treatment process resulting in extremely low net biological solids produced. The ISAM™ process will reduce the volume of waste sludge by approximately 80%, compared to a conventional SBR/aerobic digester system, and **eliminate the need for separate digesters**. Waste solids are stabilized in the anaerobic chamber, and the waste sludge concentration is over 3.5%.

The interact period continues until the liquid level in the surge basin rises to the control water level where the pump is stopped and a settle period is begun in the SBR. After the settle period, approximately 25% of the SBR basin contents are decanted.

Operating control is simplified: No influent valves are required as flow continually enters the SAM™ tank. Cycle times are reduced as mixed liquor is rapidly pumped from the SAM™ to the SBR tank at the appropriate time greatly reducing fill time.

This proposal includes a complete ISAM™ SBR system, as described in the design calculations, including:

ISAM™ SBR Process Equipment

One (1) Fluidyne Model DM21JA2 jet aeration header. The aeration header will comprise an 8" liquid manifold, 4" air manifold, and two (2) Model 210 jet aerators.

Two (2) Vertical submersible motive liquid/fill pumps (One as an on shelf standby). Each pump will be rated for 400 GPM at a total head of 23 ft., and be furnished complete with discharge connection, retrieval assembly, guide bars, all accessories, and a 5 Hp submersible motor.

Two (2) Vertical submersible effluent pumps. Each pump will be rated for 50 GPM at a total head of 30 ft., and be furnished complete with discharge connection, retrieval assembly, guide bars, all accessories, and a 3 Hp submersible motor with manual variable frequency drive.

Two (2) Rotary positive displacement blowers (One (1) as a stand-by). Each blower will be sized to deliver 95 SCFM at a total discharge pressure of 4.10 psig. Blowers will be furnished complete with inlet filter, inlet silencer, discharge silencer, pressure relief valve, check valve, inlet and discharge flexible connectors, pressure gauge, 1 case of blower oil, and a 7.5 Hp TEFC horizontal motor with manual variable frequency drive. Blower packages will be factory assembled on a steel table base. Silencers will be for field mounting.

One (1) 4" Hydro-pneumatic backflush system. The backflush system will be furnished complete with all necessary piping, valves, and supports.

One (1) Fluidyne Model FED300 fixed solids excluding effluent decanter. Decanter will be rated for a design flow rate of 300 GPM.

All in-basin air and liquid piping is included.

One (1) Preprogrammed process control panel. The microprocessor based process control panel will be capable of controlling all of the normal operating requirements of the SBR system based on liquid level and time.

One (1) Float type level monitoring systems.

One (1) Lot of valves, including:

- One (1) 6" electrically operated butterfly valves for the decant lines.

- One (1) 4" manual plug valves for the backflush system.

- One (1) 2" manual ball valve for the recirculation line.

- One (1) 2" electric ball valve for the recirculation line.

- One (1) 6" manual plug valve for influent isolation.

- One (1) 4" manual plug valves for WAS draw-off lines.

Two (2) Fluidyne Influent underflow baffles. The baffles are fabricated of fiberglass.

One (1) SBR overflow weir/scum skimmers. The overflow weir will allow flow from the SBR compartment to flow back to the influent equalization tank during the interact cycle. The weir shall also provide scum skimming of the SBR tank. The weir shall also provide flow diffusion during periods of high flow.

One (1) 4” diameter sludge withdrawal manifold.

Supports. All necessary supports for the aeration system, in-basin air and liquid piping, backflush system, and decanter are included.

Hardware. All gaskets, and flange hardware are included.

Six (6) days of startup and operator training. Provided in two (2) trips to the job site.

Budget price for complete ISAM™ SBR system _____

Prices are firm 30 Days

Submittal drawings 8 - 10 weeks

Shipment 16 weeks after approval

FOB Shipping points, freight allowed

It is our intention that this proposal includes one complete SBR process system. This proposal does not include:

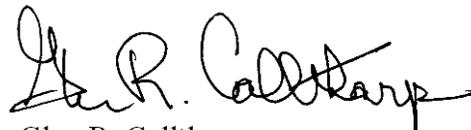
- Site and structural design
- Collection system including pump station and piping to the plant
- Nutrient feed equipment and pH feed equipment and accessories if required
- Screening equipment if required
- Chemical feed equipment if required
- Freeze protection
- Any out of basin piping, valving or supports including influent and effluent piping, conduit, etc
- Remote panels, junction boxes or disconnects
- Field wiring
- Control room or lab (Panel to be housed indoors)
- Disinfection equipment if required

- Sludge handling and drying equipment
- Walkways, handrailing or platforms
- Hoist or lifting equipment
- Explosion proof motors
- SCADA system
- Anchor bolts
- Motor starters or related controls.
- Control of any equipment not related to items in the Fluidyne scope of supply
- Off-loading of equipment, installation, job-site testing, or insurance
- Installation
- Sales or use taxes
- D.O. or ORP controls or monitoring equipment (optional)
- Permitting
- Any item or service not specified in our proposal

I trust that the enclosed information will be sufficient for your needs at this time. If you have any questions, or need additional information, please do not hesitate to contact us. Thank you for considering Fluidyne.

Very truly yours,

Fluidyne Corporation,



Glen R. Calltharp

cc: Mr. Erick Mandt
Fluidyne Corporation

Mr. Steve Hansen
Ambiente H₂O, Inc.

FLUIDYNE CORPORATION



THE EXPERIENCED LEADER IN SEQUENCING BATCH REACTOR TECHNOLOGY



ISAM™

SEQUENCING BATCH REACTOR PROCESS



THE EXPERIENCED LEADER IN SEQUENCING BATCH REACTOR TECHNOLOGY

TRUST FLUIDYNE'S EXPERIENCE

The Fluidyne ISAM™ Sequencing Batch Reactor (SBR) system incorporates the latest and most innovative technology and over thirty years of experience in providing the most reliable SBR systems producing the highest effluent quality. Fluidyne SBR systems are in operation around the world and have won numerous awards. Fluidyne SBRs consistently provide better than 10/10/5/1 (BOD₅/TSS/TN/TP) effluent quality. Fluidyne engineers have designed over 500 SBRs, and been granted over twenty patents.

A TOTALLY NEW CONCEPT IN SBR DESIGN

The Fluidyne ISAM™ Sequencing Batch Reactor system is a single train SBR process which incorporates a constant level anaerobic selector-digester chamber, followed by a surge/anoxic/mix (SAM™) tank, and one or more SBR basins.

In operation, all influent flow enters the anaerobic selector chamber where influent solids are allowed to settle much like a primary clarifier. Elimination of primary solids in the anaerobic chamber allows for much smaller SBR basins than conventional SBRs at equivalent SRTs. The anaerobic selector also creates soluble carbon as a food source for biological nutrient removal through anaerobic conversion of settleable BOD to soluble BOD. Settled solids are digested anaerobically in the anaerobic selector chamber.

The influent then flows to the SAM™ surge basin (influent equalization basin). The surge basin provides flow and nutrient equalization to optimize treatment at the full range of flows and loadings. When the level in the surge basin reaches a predetermined level, the jet motive liquid/fill pump is started, and a batch is quickly fed to the SBR reactor basin.

Several unique features of the Fluidyne ISAM™ SBR include odor control and scum skimming. Mixed liquor is maintained in the SAM™ tank to immediately react with incoming flow from the anaerobic chamber to suppress odors and initiate and accelerate carbon and nitrogen reactions. Mixed liquor from the SBR tank overflows the proprietary flow and scum control system weir, and is returned to the SAM™ surge basin, and mixed with incoming wastewater in what is referred to as an "Interact" period. In addition, nitrates are recycled to the SAM™ tank for effective and rapid denitrification. Denitrification reactions are accelerated in the presence of the unreacted soluble carbon from the raw sewage entering the SAM™ tank. Aeration and energy requirements are reduced as nitrates are fully reduced to nitrogen gas in the SAM™ tank.

FLUIDYNE PREPACKAGED ISAM™ SBRs

The Fluidyne prepackaged ISAM™ SBR is available in standard sizes for average influent flows from 5,000 GPD to 110,000 GPD. Each unit is shipped complete; prewired and prepiped. Packaged systems can be buried or installed above grade on customer provided concrete pad.

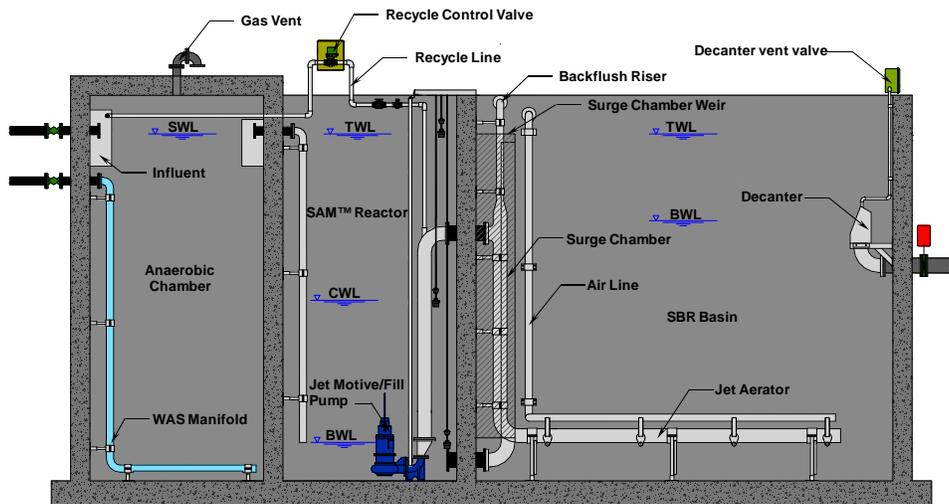
100% ON-LINE STANDBY EQUIPMENT

Fluidyne's prepackaged ISAM™ SBRs are furnished with spare mixing/fill pump and aerator assembly installed for 100% redundancy.

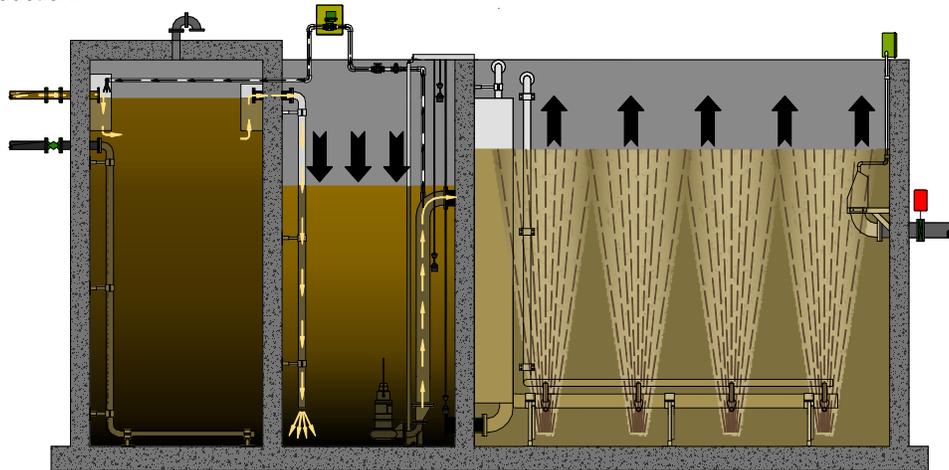


REDUCES WASTE SLUDGE BY 80%

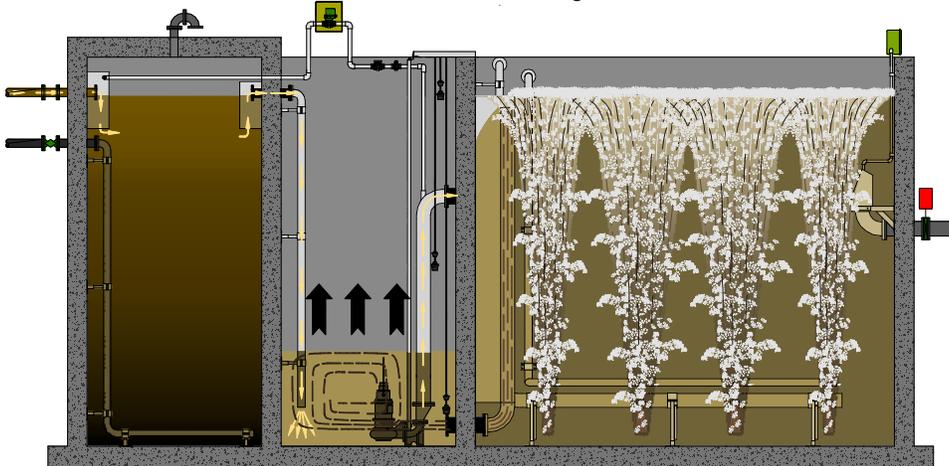
The Fluidyne ISAM™ Sequencing Batch Reactor incorporates an anaerobic selector chamber with the SAM™ SBR. All influent flow enters the anaerobic chamber where influent solids settle. The anaerobic selector chamber also creates soluble carbon as a food source for denitrification through anaerobic conversion of settleable BOD to soluble BOD. During the "Interact" phase, a portion of the motive liquid is also recirculated to the anaerobic selector chamber where the mixed liquor solids are converted from an aerobic-dominant population to a facultative-dominant population. Aerobic bacteria are selectively destroyed while enabling the low-yield, facultative bacteria to breakdown and utilize the remains of the aerobes and their byproducts. The mixed liquor then flows to the SAM™ surge basin where the facultative bacteria, in turn, are out-competed by the aerobic bacteria and subsequently broken down in the alternating environments of the aerobic SBR treatment process and the anaerobic chamber. A balance between selection and destruction is developed between the anaerobic selector chamber and the SBR treatment process resulting in extremely low net biological solids produced. The ISAM™ process will reduce the volume of waste sludge by approximately 80%, compared to a conventional SBR/aerobic digester system, and eliminate the need for separate digesters.



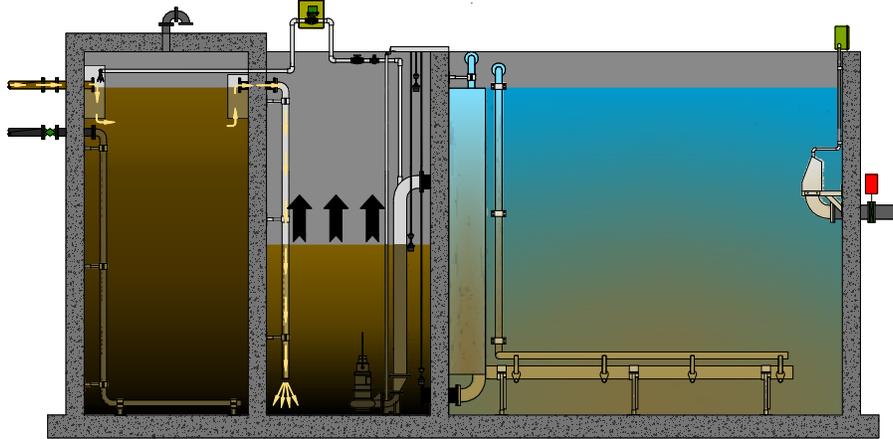
System Components: Influent continuously enters the anaerobic chamber where solids settle. Settleable BOD is converted to soluble BOD. BOD is reduced by 30%, and solids are reduced by 60%. The influent then flows to the SAM™ reactor. Mixed liquor is maintained in the SAM™ reactor to suppress odors, and initiate and accelerate carbon and nitrogen reduction.



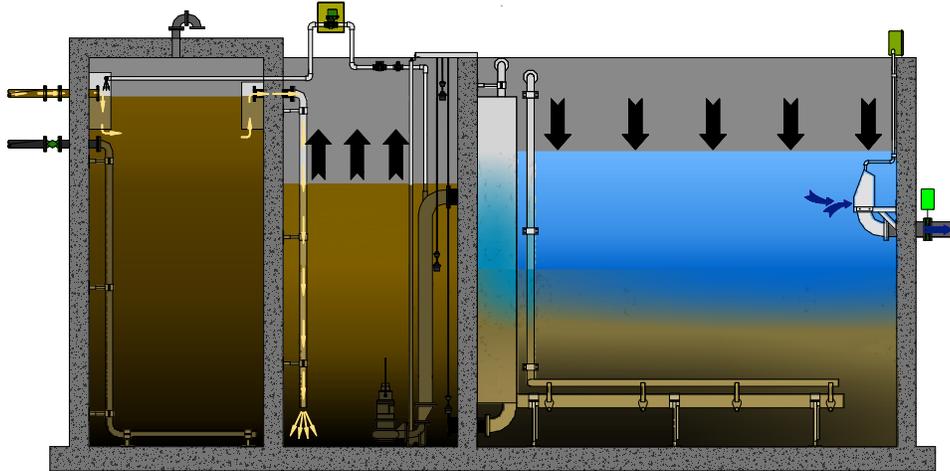
Fill Phase: When the level in the SAM™ reactor reaches a predetermined “control level” the motive liquid pump is started. The SBR basin is filled and mixed. A percentage of the pumped flow is returned to the anaerobic chamber where biological solids settle. Settled solids in the anaerobic chamber are digested.



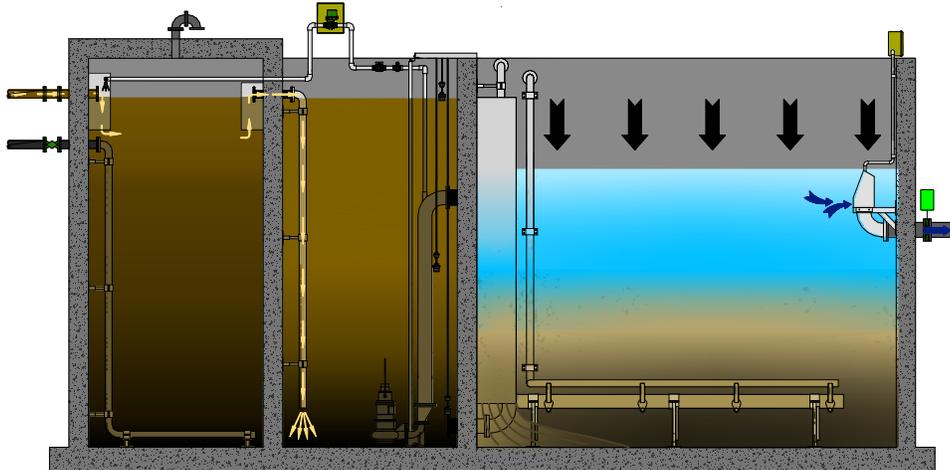
Interact Phase: When the level in the SBR reaches TWL, nitrified mixed liquor overflows the surge chamber weir and is returned to the SAM™ chamber to mix and react with the raw influent. Aeration is cycled on and off to provide the required oxygen. Denitrification is reliable and complete. Scum is also removed from the SBR basin.



Settle Phase: When the level in the SAM™ reactor again reaches “control level,” aeration is discontinued, and the SBR basin settles under perfect quiescent conditions.



Decant Phase: When the settle timer expires, the decant valve is opened, and treated effluent is withdrawn from the upper portion of the SBR basin by means of a fixed solids excluding decanter.



Filled Decant Phase: If, during peak flow events, the SAM™ reactor reaches TWL before the decant phase ends, influent flows in a reverse direction through the surge return line and overflows the surge chamber secondary weir, and is diffused into the settled sludge at very low velocity as the decant phase continues.



FLUIDYNE CORPORATION

THE EXPERIENCED LEADER IN SEQUENCING BATCH REACTOR TECHNOLOGY

CUSTOM ENGINEERED ISAM™ SYSTEMS

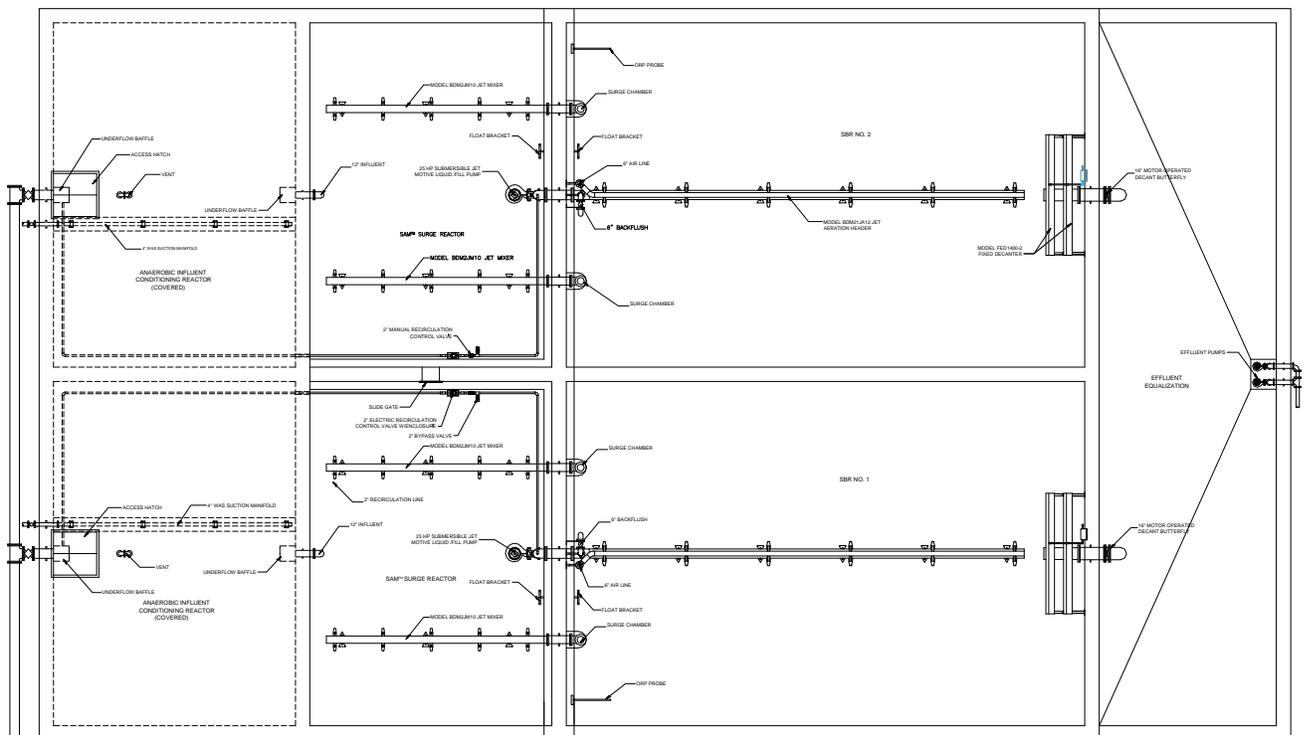
The majority of ISAM™ systems currently operating are packaged systems for daily flows of less than 100,000 GPD. However, the process offers the same advantages for larger facilities. The first advantage is that the ISAM™ requires smaller SBR basins than a conventional SBR, at identical loadings. This is due to the fact that 65% of the influent solids are removed in the anaerobic chamber, and are therefore not considered in calculation of the SRT. An ISAM™ designed for an average daily daily flow of 1.0 MGD, and an SRT of 20 days will have an SBR basin capacity of 0.67 MG, and an HRT of 16 hours. A conventional SBR designed for a 20 day SRT would have a capacity of 1.24 MG, and an HRT of 30 hours. The 1.0 MGD ISAM™ SBR design also includes the SAM™ reactor having a capacity of 0.14 MG. Since the SAM™ reactor contains mixed liquor, the actual working SRT for the ISAM™ process is 25 days, and the total volume is only 66% of that of the conventional SBR.

The ISAM™ design also includes two anaerobic influent conditioning chambers having a total capacity of 0.50 MG. Therefore, the total volume of the entire ISAM™ SBR process is 1.31 MG, and no additional digesters are required. Aerobic digesters for a conventional 1.0 MGD SBR would have a capacity of 0.30 MG if designed for a 30 day sludge age. This

means that the total volume for a 1.0 MGD conventional SBR plus aerobic digesters would be 1.54 MG. The total volume for the ISAM™ process is 1.31 MG.



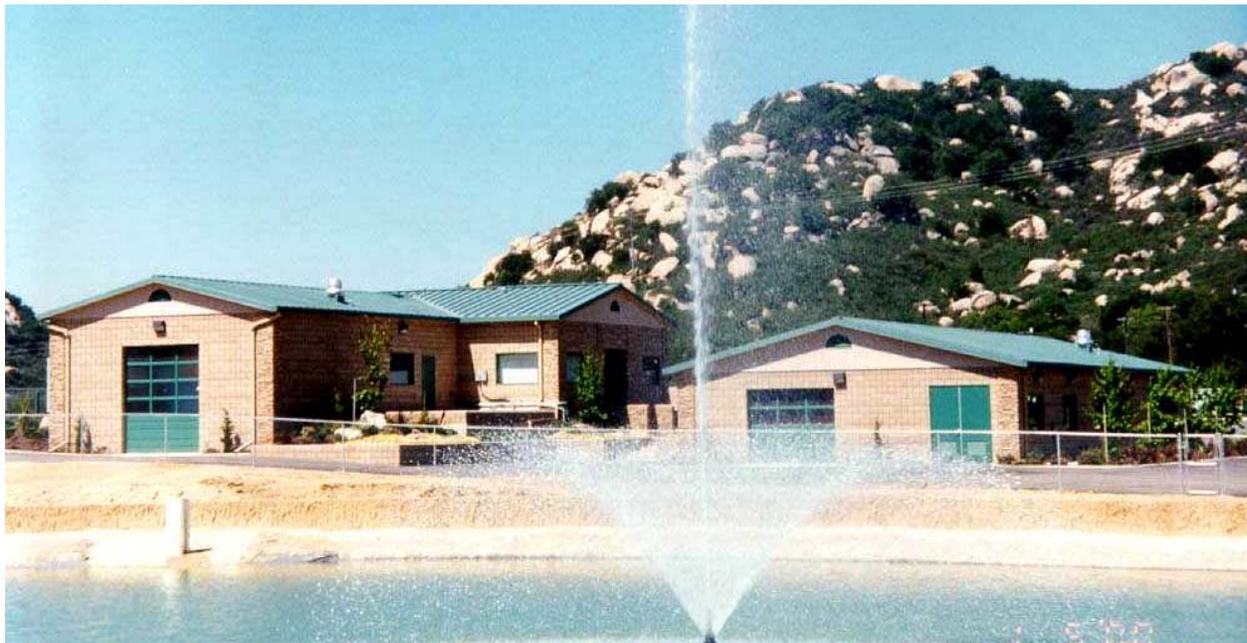
The total power consumption for a 1.0 MGD conventional SBR plus aerobic digestion would be approximately 1,680 KWH/day. The total power consumption for a 1.0 MGD ISAM™ SBR is approximately 845 KWH/day; 50% less than a conventional SBR.





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THE EXPERIENCED LEADER IN SEQUENCING BATCH REACTOR TECHNOLOGY



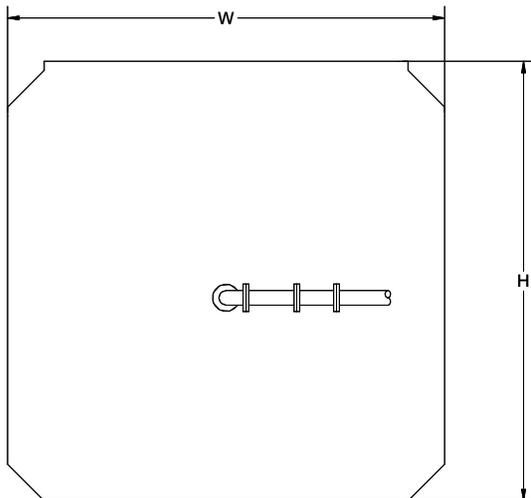
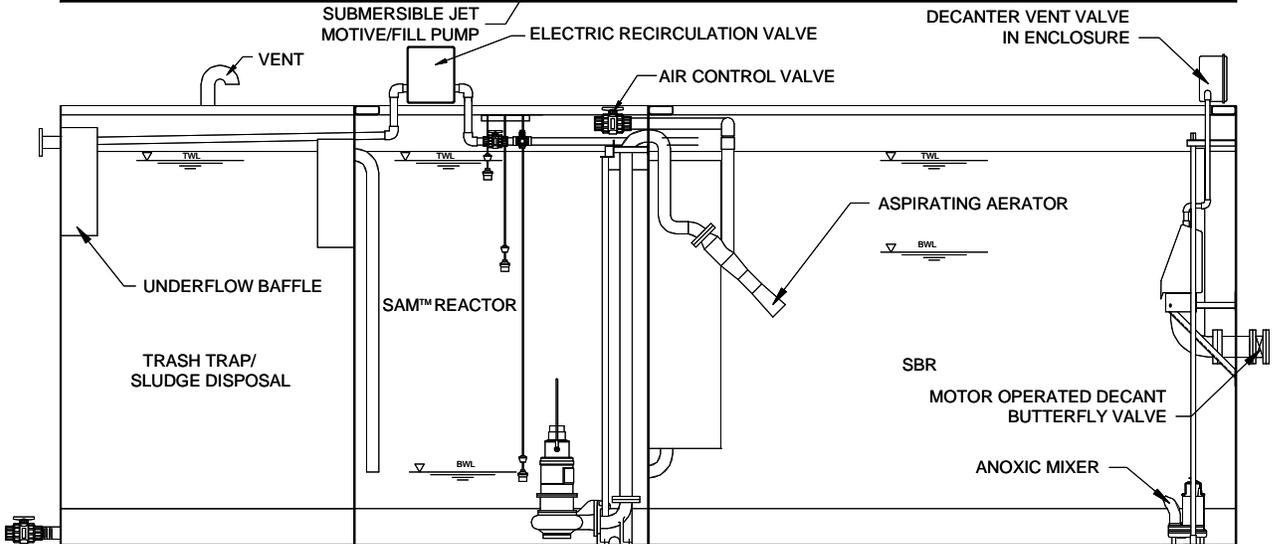
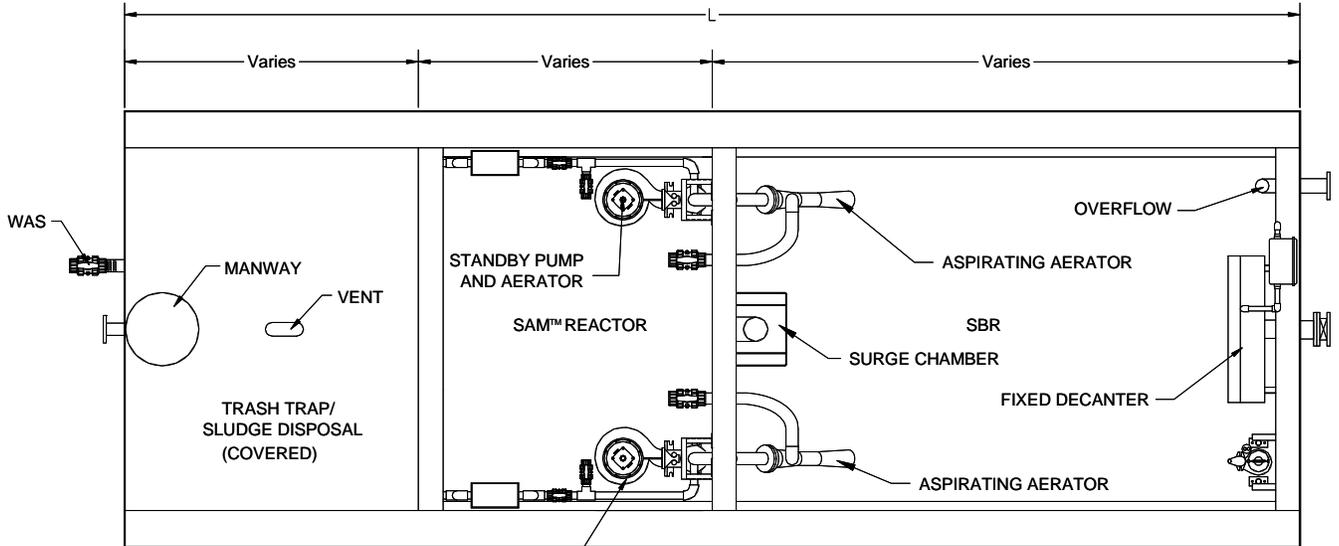
FLUIDYNE SAM™ SBR - BARONA, CA - WEEKLY REPORTS

DATE	INFLUENT					EFFLUENT						
	BOD ₅	TSS	NH ₃ -N	TKN	FOG	BOD ₅	TSS	NH ₃ -N	NO ₃	NO ₂	TKN	FOG
02/16/05	632	327	20.2	36.0	64.8	2.0	ND	ND	0.1	0.02	0.50	<1.0
02/23/05	338	226	6.7	7.8	45.5	ND	ND	ND	ND	0.02	0.60	ND
03/02/05	813	390	23.5	35.0	75.8	4.6	ND	2.0	0.1	0.01	0.80	ND
03/09/05	653	328	15.1	22.7	88.8	4.9	ND	0.2	0.3	ND	1.10	ND
03/16/05	640	237	23.7	35.9	79.4	2.7	ND	0.2	0.3	0.02	1.10	ND
03/23/05	385	445	24.1	38.2	80.7	2.2	ND	2.0	0.2	0.13	0.70	ND
03/30/05	736	358	15.2	19.3	217.0	10.0	ND	0.1	0.1	0.03	0.50	ND
04/06/05	627	338	28.3	34.5	97.0	9.0	ND	0.4	ND	ND	0.40	ND
04/13/05	784	356	23.0	27.2	31.0	12.0	ND	0.5	ND	ND	0.70	ND
04/20/05	336	223	14.0	16.6	8.4	3.5	1.9	0.4	ND	ND	3.30	<1
04/27/05	579	485	6.7	8.9	27.5	<2	ND	0.3	ND	ND	3.10	<1
05/04/05	940	334	1.0	33.1	48.9	2.9	2.5	1.0	0.1	0.08	2.60	<1
05/11/05	622	330	22.2	74.2	66.7	<2	ND	ND	ND	ND	1.80	ND
05/18/05	718	329	20.8	28.0	492.0	2.2	ND	ND	ND	ND	0.49	ND
05/25/05	575	322	13.1	13.3	450.0	4.6	ND	0.5	ND	ND	0.50	ND
06/01/05	711	688	24.0	25.8	327.0	12.3	ND	0.5	0.2	ND	0.50	ND
06/08/05	508	277	22.4	27.9	52.6	2.4	NO	0.1	0.4	ND	0.70	<1
06/15/05	343	155	14.9	22.5	90.8	<2	ND	0.5	0.4	ND	1.00	ND
06/22/05	661	477	27.6	33.5	87.2	<2	ND	0.2	0.4	ND	0.70	1.1
06/29/05	444	345	32.6	50.5	61.5	2.0	ND	0.1	0.3	0.03	0.50	ND
07/06/05	925	379	27.6	48.1	87.5	1.7	ND	0.2	0.3	0.03	0.80	ND
07/13/05	673	346	33.1	52.5	99.5	<2	ND	0.5	0.5	ND	0.90	<1.0
07/20/05	650	109	29.1	43.0	84.9	<2	ND	0.1	ND	0.04	0.70	<1.0
07/27/05	694	305	33.0	43.0	83.1	<2	ND	0.2	0.3	0.08	0.40	ND
08/03/05	580	324	26.3	28.0	65.9	3.6	ND	0.6	0.3	0.02	0.80	ND
AVG. YTD	623	337	20.9	32.2	116.5	4.6	ND	0.4	0.2	0.03	1.01	ND

FLUIDYNE CORPORATION

THE EXPERIENCED LEADER IN SEQUENCING BATCH REACTOR TECHNOLOGY

A WIDE RANGE OF PACKAGED SOLUTIONS ARE AVAILABLE



MODEL	W	L	H	HP*
ISAM™ 05	6.5	16	10.0	3
ISAM™ 10	8.5	24	10.0	5
ISAM™ 15	8.5	24	12.0	5
ISAM™ 20	11.9	24	12.0	7.5
ISAM™ 25	11.9	30	12.0	7.5
ISAM™ 30	11.9	34	12.0	10
ISAM™ 40	11.9	45	12.0	10
ISAM™ 42	11.9	48	12.0	10
ISAM™ 50	11.9	56	12.0	15
ISAM™ 60	11.9	68**	12.0	20
ISAM™ 70	11.9	72**	12.0	20
ISAM™ 75	11.9	80**	12.0	25
ISAM™ 80	11.9	90**	12.0	25
ISAM™ 90	11.9	96**	12.0	30
ISAM™ 100	11.9	112**	12.0	40
ISAM™ 110	14.0	112**	12.0	40

* EACH PUMP (ONE IS STANDBY)

** TWO TANKS (EACH TANK IS HALF OF TOTAL LENGTH)



CORPORATION

THE EXPERIENCED LEADER IN SEQUENCING BATCH REACTOR TECHNOLOGY

The Fluidyne ISAM™ SBR system provides the following benefits:

1. Ability to handle highly variable flows and loading associated with small, to medium size plants. The ISAM™ is more flexible than continuous flow plants. Regardless of flows or loading, aeration and mixing can automatically be adjusted to optimize power and prohibit filamentous growth.
2. At high flows, solids cannot wash out as with extended aeration plants as the ISAM™ SBR process utilizes quiescent settle and decant periods.
3. ISAM™ facilities are easily expandable by adding additional flow trains. The additional flow trains do not require major changes in controls; only new tankage and associated equipment.
4. ISAM™ provides a small footprint with no digesters, secondary clarifiers, RAS piping and pumping.
5. ISAM™ produces the highest quality effluent. Typical Fluidyne ISAM™ facilities are achieving less than 10 mg/L BOD₅ and TSS, less than 1 mg/L NH₃-N, less than 7 mg/L total N, and less than 2 mg/L phosphorous.
6. Easy to operate and maintain as mechanical equipment is minimized with no chasing of sludge associated with extended aeration plants.
7. Built in sludge reduction system using the anaerobic selector chamber and facultative/aerobic enhanced cell lysis significantly reduces sludge handling and hauling costs.
8. Built in flow equalization is provided in the SAM™ reactor to handle peak hourly flows.
9. Automatic scum skimming prior to effluent discharge provides highest quality effluent.
10. Exceptional after sales service by Fluidyne technicians. Fluidyne employees have been granted over 20 patents in wastewater and water treatment technology and equipment.
11. Reduced operation and maintenance costs as power usage is controlled through the Fluidyne control panel.
12. Installed cost is lower as the system comes with the in-basin equipment pre-installed
13. The anaerobic selector chamber is covered and raw wastewater reacts immediately with mixed liquor in an aerated environment, there are no odor concerns.

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Mobile: (941) 685-8234
E-mail: ptiflorida@verizon.net

ISAM™ SBR with Jet Aeration System
Design Calculations For
River Glen HOA

Feb. 25, 2012

I. DESIGN CONDITIONS:

Design flow Max month ADF	=	35,000 GPD
Peak daily flow	=	70,000 MGD
Peak hourly flow	=	61 GPM (Assumed)
Influent BOD ₅	=	250 mg/L
BOD ₅ removed in anaerobic chamber	=	30%
BOD ₅ to SBR	=	175 mg/L
	=	51 lbs./day
Effluent BOD ₅	=	20 mg/L
Influent TSS	=	250 mg/L
Removal in anaerobic chamber	=	65%
TSS to SBR	=	88 mg/L
Effluent TSS	=	20 mg/L
Influent TKN	=	30 mg/L
	=	9 lbs/day
Effluent NH ₃ -N	=	1.7 mg/L
Effluent total N	<	10 mg/L (Assumed)
Influent P	=	7.00 mg/L
	=	2 lb/day
Effluent P (Chemical feed required)	=	2.00 mg/L (Assumed)
Design MLSS at BWL	=	3,938 mg/L
Design F:M	=	0.10
SRT (SBR)	=	13 days
SRT (SBR+SAM)	=	16 days
Elevation	=	4,990 ft. MSL
Average barometric pressure	=	12.22 psia

II. BASIN DESIGN:

Number of reactor basins	=	1
Length	=	20 ft. 0 in.
Width	=	16 ft. 6 in.
Maximum SWD	=	10 ft. 6 in.
Minimum SWD	=	8 ft. 0 in.
Volume	=	0.026 MG
Retention time	=	17.8 hrs.

SAM™ reactor basin	=	1
Length	=	10 ft. 0 in.
Width	=	16 ft. 6 in.
Maximum SWD	=	10 ft. 6 in.
Minimum SWD	=	2 ft. 0 in.
Working volume	=	10,491 Gallons
Anaerobic chamber	=	1
Length	=	10 ft. 0 in.
Width	=	16 ft. 6 in.
SWD	=	10 ft. 6 in.
Volume	=	12,959 Gallons
Effluent equalization/filter feed basin	=	1
Length	=	14 ft. 0 in.
Width	=	16 ft. 6 in.
Maximum SWD	=	6 ft. 0 in.
Minimum SWD	=	1 ft. 6 in.
Working volume	=	7,775 Gallons

III. OXYGEN REQUIREMENT:

lbs. O ₂ / lb. BOD ₅ removed	=	1.25
lbs. O ₂ / lb. TKN applied	=	4.60
lbs. O ₂ recovered/ lb. NO ₃ denitrified	=	2.86
Actual Oxygen Required	=	73 lbs./day

Actual to Standard Oxygen Conversion Formula:

$$SOR = \frac{AOR}{\alpha \theta^{(T-20)} \left[\frac{\beta C_{SMID} - C_L}{C_S \left[1 + \frac{0.5(S)}{34} \right]} \right]}$$

Where:

α	=	0.85	β	=	0.95
T	=	20 °C	θ	=	1.024
C _S	=	9.09	C _L	=	1.0 mg/L

C_{SMID} = Oxygen saturation concentration at 50 % submergence at site elevation and temperature.

C_{SMID} = 8.70 mg/L

Therefore:

Standard Oxygen Required (Average)	=	122 lbs./day
Peaking factor	=	1.50
Design SOR (Peak)	=	182 lbs./day

IV. PROCESS DESIGN

Cycle time at design flow	=	4.23 hrs.
Fill time	=	0.26 hrs.
Aerated interact at average SOR	=	1.41 hrs.
Aerated interact at peak SOR	=	2.12 hrs.
Anoxic interact at average SOR	=	1.47 hrs.
Anoxic interact at peak SOR	=	0.76 hrs.
Settle time	=	0.75 hrs.
Decant time	=	0.34 hrs.
Total cycle time	=	4.23 hrs.
Submergence	=	8.5 ft.
Total aeration time (Peak)	=	2.12 hrs./cycle
	=	12.0 hrs./day
SOR for aeration design	=	15 lbs./hr.
Design gassing rate	=	47 SCFM / jet
Site gassing rate	=	53 ICFM / jet
Absorption efficiency	=	15.7 %
Design air flow	=	93 SCFM
Jets required per basin	=	2
Aerators per basin	=	1
Jets per aerator	=	2

V. BLOWER CALCULATIONS:

Operating blowers	=	1
Air flow per blower	=	93 SCFM
Inlet losses	=	0.50 psig
Net inlet pressure	=	11.72 psia
Discharge piping losses	=	0.50 psig
Aerator losses	=	3.56 psig
Total discharge pressure	=	4.06 psig
Design ambient temperature	=	100 ° F
	=	560 ° R
Site air flow required	=	125 ICFM
Equivalent sea level pressure	=	6.10 psig
Assumed blower efficiency	=	45 %
BHp per blower	=	4.4
Total blower BHp	=	4.4
Blower motor Hp	=	5

VI. PUMP CALCULATIONS:

Jet motive liquid pump:

Pumps per basin	=	1
Flow per pump	=	398 GPM
Total pump head	=	24 ft.
Assumed pump efficiency	=	75 %
BHp per pump	=	3.2
Pump motor Hp	=	5

VII. DECANTER SIZING:

Cycles per day	=	5.67
Batch volume	=	6,171 Gallons
Decant flow	=	300 GPM

VIII. SUMMARY:

Standard Oxygen Required (Average)	=	122 lbs./day
Standard Oxygen Required (Peak)	=	182 lbs./day
Power usage (Average)	=	69 kWh/day
Power usage (Peak)	=	82 kWh/day
Concrete required for basins **	=	133 yd ³
** Walls: 12" Slab: 12"		Anaerobic tank cover 12"

IX. SLUDGE PRODUCTION CALCULATIONS:

lb VSS/lb BOD ₅ removed @ T _{DES}	=	0.49
lb VSS/lb NH ₃ -N removed @ T _{DES}	=	0.17
lb VSS/lb NO ₃ -N removed @ T _{DES}	=	0.80
Total VSS production	=	26 lb/day
Total sludge for digestion	=	32 lb/day
Anaerobic volatile reduction	=	50%
Waste sludge concentration	>	4.0%
Sludge to disposal	=	19 lbs./day
	=	58 GPD
Sludge storage	=	90 days

X. NITRIFICATION/DENITRIFICATION

Minimum mixed liquor temperature	=	10 °C
ML dissolved oxygen	=	1.0 mg/L
Alkalinity required for nitrification	=	140 mg/L
Alkalinity recovered, denitrification	=	34 mg/L

Net influent alkalinity required	=	106 mg/L
Max. nitrifier growth rate	=	0.125 days ⁻¹
Minimum SRT required for nitrification	=	8.0 days
Actual SRT at minimum temp.(SBR)	=	11.5 days
Kn, half velocity constant	=	0.22 mg/L
Growth rate for heterotrophs/nitrifiers	=	0.087
Projected effluent soluble NH ₃ -N	=	0.51 mg/L
Specific utilization rate	=	0.25 lbs BOD ₅ /lb MLVSS
MLVSS required for BOD & NH ₃ removal	=	206 lbs.
MLVSS percentage in MLSS	=	80%
MLVSS	=	2,400 mg/L
Tank volume req. for BOD & NH ₃ removal	=	0.01 MG
SBR specific denitrification rate at T _{MIN}	=	0.020 g/g/day
NO ₃ removed at T _{MIN} in SBR	=	2 lb/day
NO ₃ removal required in SAM	=	1 lb/day
SAM specific denitrification rate at T _{MIN}	=	0.025 g/g/day
SAM MLVSS required for denitrification	=	48 lbs.
SAM tank volume for NO ₃ removal	=	0.002 MG
Total tank volume required	=	0.013 MG
Actual tank volume provided	=	0.039 MG

APPENDIX C – TOWN OF BERTHOUD AGREEMENTS

1. Agreement to Provide Residential Sewer Service
2. Agreement for Operation and Maintenance of Sewer Facilities

AGREEMENT TO PROVIDE RESIDENTIAL SEWER SERVICE

1. PARTIES. The Parties to this Agreement to Provide Residential Sewer Service ("Agreement") are: the **TOWN OF BERTHOUD**, a Colorado municipal government ("Town"); **RIVER GLEN HOMEOWNERS ASSOCIATION**, a Colorado non-profit corporation ("RGHOA"); and **RIVERSIDE FARM HOMEOWNERS ASSOCIATION** for Filing 1, a Colorado non-profit corporation ("RFHOA"), collectively the "HOAs", and shall specifically apply to the River Glen Subdivision and the Riverside Farm Subdivision, Phase 1.

2. RECITALS AND PURPOSES. The RGHOA owns and operates a sanitary sewer system and serves RFHOA's development by contractual agreement. This system is in need of future upgrades in order to meet federal and state health standards. In lieu of such system improvements, the HOAs desire to connect the existing private system to the Town's sanitary sewer system, which connection will require the installation of a line extension to the Town's existing facilities. The HOAs and Larimer County have entered into an *Agreement for Sanitary Sewer Facility Financing* ("County Agreement"), the terms of which provide for the establishment of a Local Improvement District ("District") by Larimer County to finance the construction and installation of certain sanitary sewer facilities on RGHOA property located generally in the NE ¼ of Section 34 and the SE ¼ of Section 27, generally west of County Road 17, north of County Road 2E, and east of US Highway 287, including a new lift station ("Lift Station") and a new sanitary sewer line ("New Sewer Line") extending north from HOA property and within the public right-of-way of County Road 17 to connect with the existing sewer line, known as the "Dry Creek Interceptor" (such Lift Station and New Line collectively referred to as the "Facilities"). Under the terms of the County Agreement, the District will finance, construct, and own the Facilities until conveyed after repayment of the financing; provided, however, that the District shall not be responsible for the operation and maintenance of the Facilities. Upon retirement of the District's incurred debt through assessments to the HOAs (and by Line Reimbursement Fees charged to other potential users of the Facilities), the District shall transfer ownership of the Facilities to the HOAs which shall immediately transfer the Facilities to the Town. Accordingly, the purpose of this Agreement is to set forth the terms and conditions whereby the Town will process the sewage from the HOAs delivered to the Town's existing Dry Creek Interceptor and for the maintenance of such Facilities. The Parties covenant and acknowledge that the Recitals and Purposes are incorporated herein, and they further agree as follows:

3. SALE OF TAPS TO HOAs.

3.1 SEWER TAPS. The Town will provide eighty-six (86) sewer taps (sixty-five [65] sewer taps to RGHOA and twenty-one [21] sewer taps to RFHOA), upon payment to the Town of the fees for eighty-six (86) taps in the amount of \$6,285 per tap or the Town's then current tap fee, whichever amount is less as of the date of payment, such payment to be made on or before December 31, 2014. After such date, the price of the taps will be charged at the Town's then current rate for single family residences. Any taps beyond these eighty-six (86) taps will not be issued and no connections will be made to the District's system until both the District and Town are paid their respective fees. All parties shall give written notice to the other parties as to issuance of any taps or connections to the other party's Facilities.

3.2 MAINTENANCE OF FACILITIES. The Town agrees to maintain the Facilities from the time of connection to the Town's Dry Creek Interceptor and Town will continue to operate and maintain the Facilities after ownership of the Facilities is transferred to the Town. The Town shall be responsible for all of the costs and expenses of the operation, maintenance, replacement and repairs to the Facilities from date of connection to the Dry Creek Interceptor

as more fully described in the initial Operation and Maintenance Agreement that may be attached to this Agreement for informational purposes.

4. DESCRIPTION OF FACILITIES. See attached Exhibit A which is incorporated herein.

5. EASEMENTS.

5.1 County Road 4 - In the event that the Town annexes County Road 4, or any portion thereof in which the Facilities may be constructed and located, the Town agrees to grant the County and/or District, as the case may be, a license, easement or permit for the utilization of the right-of-way associated with County Road 4. Such license, easement or permit will expire upon transfer of the Facilities to the Town pursuant to this Agreement.

5.2 County Road 17 - The New Sewer Line shall be installed within the County Road 17 right-of-way. In the event that the Town annexes County Road 17, or any portion thereof in which the New Sewer Line may be constructed and located, the Town agrees to grant the County and/or District, as the case may be, a license, easement or other permits for the utilization of the right-of-way and new sewer line within the County Road 17 right-of-way. Such license, easement or permit relating to the New Sewer Line will expire upon the transfer of the new sewer line to the Town pursuant to this Agreement.

6. CONSTRUCTION. The HOAs agree that they will cooperate and coordinate, to the extent that the HOAs are permitted, in the engineering and design of the Facilities with the Town to ensure that the Facilities will conform to the Town's then existing standards and requirements; provided, however, that the parties acknowledge that final design and construction of the Facilities are subject to approval and inspection by Larimer County. The Town agrees to review all submitted plans within ten (10) working days of submittal. Construction of the Facilities shall not commence until the Town has approved the final design and construction plans, such approval to not be unreasonably withheld. Prior to construction by the District, the HOAs will convey to the Town perpetual, non-exclusive easements for access to the lift system, flow meter and pipeline that are acceptable to the Town and the HOAs. The Town, at its own cost and expense, will install a flow ("master") meter in the line leading from the Lift Station into the New Sewer Line connecting to the Town's sanitary sewer system.

7. ACCEPTANCE OF WASTEWATER. Upon completion of construction and connection of the Facilities to the Town's sanitary sewer system, the Town shall accept all residential sanitary waste water from the Facilities into the Town's sanitary sewer system. The Town shall charge the HOAs all applicable service fees that are charged to other in-Town users on a non-discriminatory basis and at the same rates that are charged to other in-Town users.

8. FEES AND BILLING.

8.1 Fees. The Town shall charge and invoice the HOAs as follows:

- (a) a monthly **processing fee** based upon the sanitary sewer flow measured by the master meter in accordance with the Town's established fee for the processing and treatment of bulk sewage (currently \$6.53 per thousand gallons);
- (b) a monthly **service charge** (currently \$27.06) per single family residential tap for only those households that are connected to the Town's sanitary sewer system; and

- (c) a monthly **lift station fee** for the operation and maintenance of the Lift Station (currently \$4.00 per single family residence) for those that are connected to the Town's sanitary sewer system.

These obligations of the HOAs shall continue after conveyance of the Facilities pursuant to paragraph 10 herein.

Such invoices shall be issued no more frequently than monthly, and no less frequently than quarterly at the mutual agreement of the Town and the HOAs. For the duration of this Agreement, the monthly processing fee plus the monthly service charge and monthly lift station fee shall not exceed the fees for the same services paid by in-town Berthoud residents; provided, however, that during the term of this Agreement, the Town reserves the right to individually bill each user of the Facilities in accordance with its then applicable policies.

8.2 Possible Surcharge. In addition, the Town will impose a surcharge for any hazardous waste not typically generated from residential usage, as that term is defined by the Colorado Department of Health. The HOAs will be responsible for all charges including, but not limited to, payment of additional fees and/or any fines levied because of hazardous wastes dumped into the Town's system through the pipelines of the subdivisions.

8.3 Use. The Lift Station and all pipelines are for transport only, and not for processing or sanitizing.

8.4 Additional Remedy. The parties agree that although each HOA is responsible for their payments to the Town for their respective subdivisions, if either or both of the HOAs become delinquent the Town may bill each property owner based upon the Town's established billing practices and each property owner shall be subject to the rights of the Town to place a lien and/or certify to Larimer County, the assessment lien for delinquent payments under this Agreement.

9. CONNECTION TO DRY CREEK INTERCEPTOR. The Town will pay the fee for connection of the New Sewer Line to be constructed by the District to the existing sewer main known as the Dry Creek Interceptor. This fee will not be an obligation of the HOAs or the District.

10. LINE REIMBURSEMENT FEE. The HOAs will charge a fee (herein, the "Line Reimbursement Fee") to any properties or parties other than those within the River Glen Subdivision and the Riverside Farm Phase I Subdivision for use of the Facilities or any portion thereof. At the time of issuance of all sewer tap connections by the Town of Berthoud for the Town's sanitation system to properties or parties other than the River Glen and Riverside Farm Filing 1 Subdivisions, the Town agrees that it will remit a Line Reimbursement Fee, when and if paid, as established by the HOAs from such new connector in addition to its regular fees and charges. If the amount of the Reimbursement Fee established by the HOAs is legally challenged or payment is not made, the Town is under no obligation to initiate or respond to litigation or collect the Line Reimbursement Fee.

10.1 All Collected Line Reimbursement Fees shall be paid to the HOAs within twenty-eight (28) days of collection by the Town to be utilized by the HOAs for repayment of the loan under the County Agreement. Pursuant to Paragraph 10, the HOAs will transfer ownership of the Facilities to the Town after the loan created by the District is paid in full. After such transfer of ownership, this Line Reimbursement Fee may continue to be assessed, and retained by, the Town against all new connectors to the Facilities.

10.2 The HOAs acknowledge there may be certain properties within the serviceable area that may be best served by other infrastructure and nothing herein shall be construed as imposing a requirement on the Town to require all properties in the area to utilize this New Sewer Line.

10.3 The HOAs understand and agree that, by entering into this Agreement, the Town makes no representations or warranties that any or all of the possible future tap connections to the Line Reimbursement Fee will be issued by the Town.

11. CONVEYANCE OF FACILITIES. Upon payment in full of the loan created by the District and the HOAs, the District will transfer ownership of the Facilities to the HOAs for the consideration of \$10. Immediately thereafter, the HOAs will transfer ownership of the Facilities to the Town, along with sufficient property rights to access and operate the same. Because it is anticipated this transfer will occur in the future, perhaps twenty (20) years into the future, the HOAs and the Town will, within ninety (90) days of execution of this Agreement, put into place documents and instruments which will facilitate this transfer.

12. NON-CONSENT TO ANNEXATION. Nothing herein shall be construed as consent to annexation to the Town, or a waiver by any property owner or member of the HOA to any objections to annexation of such properties into the Town. The Town agrees that after conveyance of the Facilities it shall not condition continued service upon annexation of the properties served under this Agreement.

13. ASSIGNMENT. The HOAs shall not assign this Agreement to any third party except with the prior written consent of the Town.

14. PARAGRAPH CAPTIONS. The captions of the paragraphs are set forth only for convenience and reference, and are not intended in any way to define, limit, or describe the scope or intent of this Agreement.

15. ADDITIONAL DOCUMENTS OR ACTION. The Parties agree to execute any additional documents and to take any additional action necessary to carry out this Agreement.

16. INTEGRATION AND AMENDMENT. This Agreement represents the entire agreement between the Parties as to the provision of sanitary sewer service and there are no oral or collateral agreements or understandings with respect to the funding of said Line Reimbursement Fee. Only an instrument in writing signed by all Parties may amend this Agreement. If any provision of this Agreement is held to be invalid or unenforceable, no other provision shall be affected by such holding, and all of the remaining provisions of this Agreement shall continue in full force and effect.

17. ALTERNATIVE DISPUTE RESOLUTION. In the event of any dispute or claim arising under or related to this Agreement, the Parties shall use their best efforts to settle such dispute or claim through good faith negotiations with each other. If such dispute or claim is not settled through negotiations within twenty-eight (28) days after the earliest date on which one party notifies the other party in writing of its desire to attempt to resolve such dispute or claim through negotiations, then the Parties agree to attempt in good faith to settle such dispute or claim by mediation conducted under the auspices of the Judicial Arbitrator Group (JAG) of Denver, Colorado or, if JAG is no longer in existence, or if the Parties agree otherwise, then under the auspices of a recognized established mediation service within the State of Colorado. Such mediation shall be conducted within sixty (60)

days following either party's written request therefore. If such dispute or claim is not settled through mediation, then either party may initiate a civil action in the District Court for Larimer County.

18. GOVERNING LAW. The laws of the state of Colorado shall govern this Agreement.

19. BINDING EFFECT. This Agreement shall accrue to the benefit of, and be binding upon, the Parties, and their respective legal representatives, successors, and assigns; provided, however, that nothing in this paragraph shall be construed to permit the assignment of this Agreement except as otherwise specifically authorized in this Agreement.

[Remainder of page intentionally left blank]

RIVER GLEN HOMEOWNERS' ASSOCIATION

Tye Riley
By:
Title: River Glen HOA President

5-23-2013
Date

RIVERSIDE FARM HOMEOWNERS' ASSOCIATION

Richard [Signature]
By:
Title:

5-23-13
Date

TOWN OF BERTHOUD

[Signature]
By:
Title: Mayor

5-21-13
Date

ATTEST:

Mary K. Cowdin
Mary K. Cowdin, Town Clerk

EXHIBIT A

The lift station includes an alternating dual submersible pump system each with a capacity of 80 gallons per minute (gpm) or 115,200 gallons per day (gpd), automated controls for operation, automated flow meter to measure and record effluent flow from the lift station. The lift station building will house controls and ancillary equipment associated with the operation of the lift station.

The force main and gravity sanitary sewer main transfers effluent from the River Glen HOA lift station to the Town of Berthoud collection system at the Dry Creek Interceptor's intersection with South County Road 17. The force main is approximately 5,150 feet of 4-inch high density polyethylene (HDPE). The gravity sanitary sewer main is approximately 1,000 feet of 8-inch polyvinyl chloride (PVC). The force main transitions to a gravity sanitary sewer main at a manhole located within the Weld County Road 17 right of way.

AGREEMENT FOR OPERATION AND MAINTENANCE OF SEWER FACILITIES

1. **PARTIES.** The Parties to this *Agreement to Provide Residential Sewer Service* ("Agreement") are: the **TOWN OF BERTHOUD**, a Colorado municipal government, ("Town"); and **RIVER GLEN HOMEOWNERS ASSOCIATION**, a Colorado non-profit corporation, and **RIVERSIDE FARM HOMEOWNERS ASSOCIATION**, a Colorado non-profit corporation (the latter two parties collectively referred to as the "HOAs").

2. **RECITALS AND PURPOSES.** The HOAs and Larimer County have entered into an *Agreement For Sanitary Sewer Facility Financing* ("County Agreement"), the terms of which provide for the establishment of a local improvement District ("District") by Larimer County to finance the construction and installation of certain sanitary sewer facilities: a lift station ("Lift Station") on the River Glen HOA property located generally in the NE ¼ of Section 34 and the SE ¼ of Section 27, generally west of County Road 17, north of County Road 2E, and east of US Highway 287, together with a new sewer line extending from the Lift Station to the public right-of-way of County Road 17, then north from the HOA property and within the public right-of-way of County Road 17 ("New Sewer Line") to connect with the Town's existing Dry Creek Interceptor. The Lift Station and the New Sewer Line are collectively referred to as "The Facilities."

Under the terms of the County Agreement, the Improvement District will finance, construct, and own the Facilities and the County Agreement further requires that the HOAs shall be responsible for the operation and maintenance of the Facilities at all times, such operation and maintenance to be "in complete accord with the rules and regulations of the Larimer County Health Department and the Colorado Department of Health and Environment. The County Agreement further provides that the HOAs may transfer operation and maintenance to the Town.

Accordingly, the purpose of this Agreement is to set forth the terms and conditions whereby the Town will operate and maintain the Facilities. Therefore, the Parties covenant, acknowledge and agree as follows:

3. **DESCRIPTION OF FACILITIES.** The Facilities are as described on the attached Exhibit A which is incorporated herein.

4. **OPERATION AND MAINTENANCE.** In consideration of fees paid to the Town by the HOA under separate agreement, upon completion of the construction of the Facilities and acceptance by the District of such completed Facilities, the Town will assume responsibility for the operation and maintenance of the Facilities but the Town will not be responsible for any maintenance and repairs within the subdivisions and will not be responsible for any backups or problems within the River Glen or Riverside Farm subdivisions themselves except as a result of direct action or inaction by the Town. The Town will continue to operate and maintain the Facilities after ownership of the Facilities is transferred to the Town and will be solely responsible for all costs of operation, maintenance, replacement repair of the Facilities. Town shall not discriminate with respect to such maintenance and fees charged to the HOAs as more fully set forth in the *Agreement to Provide Residential Sewer Service*.

5. **COVENANT.** For purposes of representation to the District for use in conjunction with the District's financing of the Facilities, and only for such purpose, the Parties hereby covenant and agree that they shall, in accordance with prudent wastewater utility practices: (i) at all times operate or cause the Facilities to be operated in an efficient manner; (ii) maintain or cause to maintain the Facilities in good repair, working order and operating condition; (iii) from time to time, make or cause

to make all necessary and proper repairs, renewals, replacements, additions, betterments, and improvements with respect to the Facilities so that the HOAs and the Town's sanitary sewage business carried on in conjunction therewith shall be properly and advantageously conducted; provided, however, pertaining to the lift station only, that this covenant shall not be construed as requiring the Town to expend any funds that are derived from sources other than this Agreement or other receipts of the operation of the Facilities that are not pledged by the HOAs to the District under any loan agreement, and provided further that nothing herein shall be construed as preventing the Parties from doing so at their individual discretion.

6. ASSIGNMENT. The HOAs shall not assign this Agreement to any third party except with the prior written consent of the Town.

7. PARAGRAPH CAPTIONS. The captions of the paragraphs are set forth only for convenience and reference, and are not intended in any way to define, limit, or describe the scope or intent of this Agreement.

8. ADDITIONAL DOCUMENTS OR ACTION. The Parties agree to execute any additional documents and to take any additional action necessary to carry out this Agreement.

9. INTEGRATION AND AMENDMENT. This Agreement represents the entire agreement between the Parties and there are no oral or collateral agreements or understandings with respect to the funding of said Line Extension. Only an instrument in writing signed by all Parties may amend this Agreement. If any provision of this Agreement is held to be invalid or unenforceable, no other provision shall be affected by such holding, and all of the remaining provisions of this Agreement shall continue in full force and effect.

10. ALTERNATIVE DISPUTE RESOLUTION. In the event of any dispute or claim arising under or related to this Agreement, the Parties shall use their best efforts to settle such dispute or claim through good faith negotiations with each other. If such dispute or claim is not settled through negotiations within twenty-eight (28) days after the earliest date on which one party notifies the other party in writing of its desire to attempt to resolve such dispute or claim through negotiations, then the Parties agree to attempt in good faith to settle such dispute or claim by mediation conducted under the auspices of the Judicial Arbitrator Group (JAG) of Denver, Colorado or, if JAG is no longer in existence, or if the Parties agree otherwise, then under the auspices of a recognized established mediation service within the State of Colorado. Such mediation shall be conducted within sixty (60) days following either party's written request therefore. If such dispute or claim is not settled through mediation, then either party may initiate a civil action in the District Court for Larimer County.

11. GOVERNING LAW. The laws of the state of Colorado shall govern this Agreement.

12. BINDING EFFECT. This Agreement shall accrue to the benefit of, and be binding upon, the Parties, and their respective legal representatives, successors, and assigns; provided, however, that nothing in this paragraph shall be construed to permit the assignment of this Agreement except as otherwise specifically authorized in this Agreement.

RIVER GLEN HOMEOWNERS' ASSOCIATION

BY: Tye Riley
Title: HOA President

MAY 22, 2013
Date

RIVERSIDE FARM HOMEOWNERS' ASSOCIATION

BY: Richard Gulchof
Title: HOA President

May 22, 2013
Date

TOWN OF BERTHOUD

BY: [Signature]
Title: Town Administrator

May 23, 2013
Date

ATTEST:

Mary K. Cowdin
Mary K. Cowdin, Town Clerk

Acknowledged and agreed to by the Board of County Commissioners of Larimer County, acting as the Board of Directors of the Larimer County Improvement District No.2012-1 (River Glen).

LARIMER COUNTY IMPROVEMENT DISTRICT NO.2012-1

By: _____
Chair

EXHIBIT A

The lift station includes an alternating dual submersible pump system each with a capacity of 80 gallons per minute (gpm) or 115,200 gallons per day (gpd), automated controls for operation, automated flow meter to measure and record effluent flow from the lift station. The lift station building will house controls and ancillary equipment associated with the operation of the lift station.

The force main and gravity sanitary sewer main transfers effluent from the River Glen HOA lift station to the Town of Berthoud collection system at the Dry Creek Interceptor's intersection with South County Road 17. The force main is approximately 5,150 feet of 4-inch high density polyethylene (HDPE). The gravity sanitary sewer main is approximately 1,000 feet of 8-inch polyvinyl chloride (PVC). The force main transitions to a gravity sanitary sewer main at a manhole located within the Weld County Road 17 right of way.

APPENDIX D – WASTEWATER TREATMENT ENTITY STATEMENT

Town of Berthoud
328 Massachusetts Ave.
P.O. Box 1229
Berthoud, CO 80513-2229
Ph. 970.532.2643 Fax 970.532.0640



March 26, 2013

Colorado Department of Public Health & Environment
Water Quality Control Division, Engineering Section
4300 Cherry Creek Drive South
Denver, CO 80246-1530

RE: Berthoud Wastewater Treatment Plant Statement

To Whom It May Concern:

This letter is submitted to inform CDPHE that the Town will accept and treat wastewater at an instantaneous peak flow rate of 80 gpm (115,200 gpd) and projected peak day flow of 36,990 gpd from the proposed River Glen HOA lift station. It is our understanding that the River Glen HOA lift station will serve both River Glen and Riverside Farms subdivisions, a total of 110 lots.

The Town of Berthoud's Water Reclamation Plant (Permit No. CO-0046663) is currently permitted to serve up to 2 million gallons per day (MGD). The Plant is currently seeing low flows at 0.52 MGD and peak flow of 0.9 MGD.

The Town's Water Reclamation Plant is currently meeting all necessary permitted activities and has no violations. The attached document is a section from the Town's Wastewater Master Plan completed in 2011 by JVA, Inc., and this section discusses a 20-year outlook.

The Town of Berthoud also adopted ordinance No. 941: AN ORDINANCE OF THE TOWN OF BERTHOUD, LARIMER AND WELD COUNTIES, COLORADO ADOPTING THE INDUSTRIAL PRETREATMENT PROGRAM AND ENFORMENT RESPONSE PLAN CODE TO REGULATE AND CONTROL THE INTRODUCTION OF POLLUTANTS.

The existing sanitary sewer main that River Glen will connect to is a 24-inch line, this line was put into service on the south side of Town for future flows and currently has only one user connected. If you need any further information, please feel free to contact me at 970-532-2643.

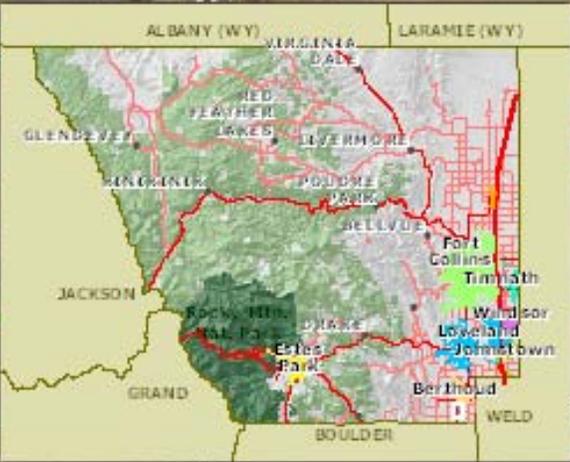
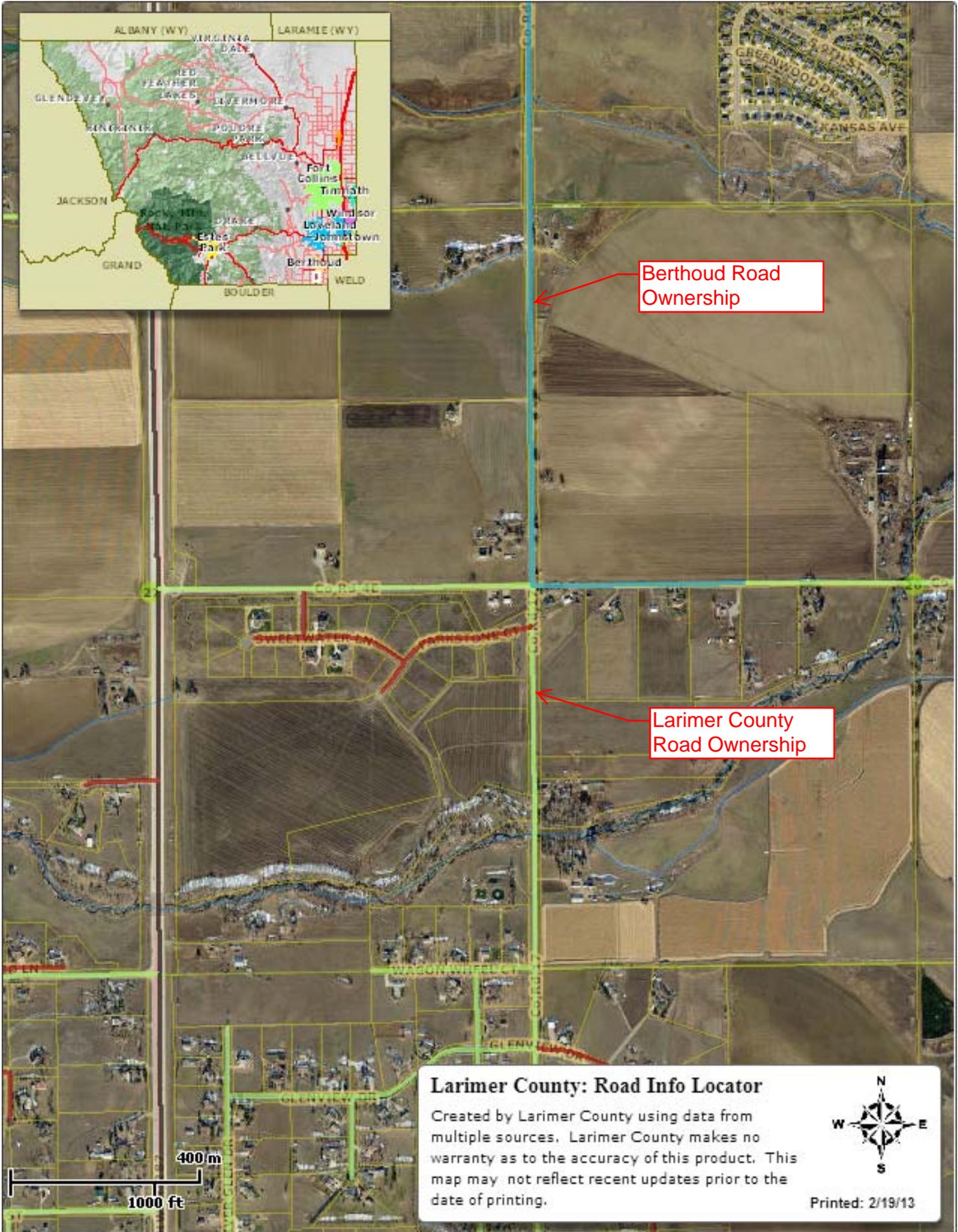
Sincerely,

A handwritten signature in blue ink, appearing to read "Michael Hart", is written over the "Sincerely," text.

Michael Hart
Town Administrator

APPENDIX E – PROOF OF OWNERSHIP AND LEGAL DESCRIPTION

1. Larimer County Map – Road Ownership
2. Deed (title) for Lift Station Property Ownership



Berthoud Road Ownership

Larimer County Road Ownership

Larimer County: Road Info Locator

Created by Larimer County using data from multiple sources. Larimer County makes no warranty as to the accuracy of this product. This map may not reflect recent updates prior to the date of printing.

Printed: 2/19/13

400m
1000 ft

THIS DEED, Made this _____ day of January , 19 82,

between GLENVIEW COURT, a limited partnership

of the County of Larimer and state of Colorado, of the first part, and RIVER GLEN HOMEOWNERS' ASSOCIATION, a Colorado Non-Profit Corporation

of the County of Larimer and state of Colorado, of the second part,

STATE DOCUMENTARY FEE
\$ _____

WITNESSETH, That the said part Y of the first part, for and in consideration of the sum of

-----Ten (\$10)----- DOLLARS, to the said part Y of the first part in hand paid by the said part Y of the second part, the receipt whereof is hereby confessed and acknowledged, has remised, released, sold, conveyed and QUIT CLAIMED, and by these presents does remise, release, sell, convey and QUIT CLAIM unto the said part y of the second part, its heirs, successors and assigns, forever, all the right, title, interest, claim and demand which the said part y of the first part has in and to the following described lot or parcel of land situate, lying and being in the County of Larimer and State of Colorado, to wit:

All of the common areas of RIVER GLEN SUBDIVISION, as amended as appears on the Subdivision Plat of record in such County; specifically including the area within which is situate the wastewater treatment facility

TO HAVE AND TO HOLD the same, together with all and singular the appurtenances and privileges thereunto belonging or in anywise thereunto appertaining, and all the estate, right, title, interest and claim whatsoever, of the said part Y of the first part, either in law or equity, to the only proper use, benefit and behoof of the said part y of the second part, its heirs and assigns forever.

IN WITNESS WHEREOF, The said part Y of the first part has hereunto set its hand and seal the day and year first above written.

Signed, Sealed and Delivered in the Presence of
GLENVIEW COURT, a limited partnership [SEAL]
James H. Tull [SEAL]
Arthur L. Bronstein [SEAL]

STATE OF COLORADO, }
County of BOULDER } ss.

The foregoing instrument was acknowledged before me this 15th day of January 19 82, by James H. Tull and Arthur L. Bronstein of GLENVIEW COURT, a Limited Partnership.

My commission expires 9-22, 1982. Witness my hand and official seal.

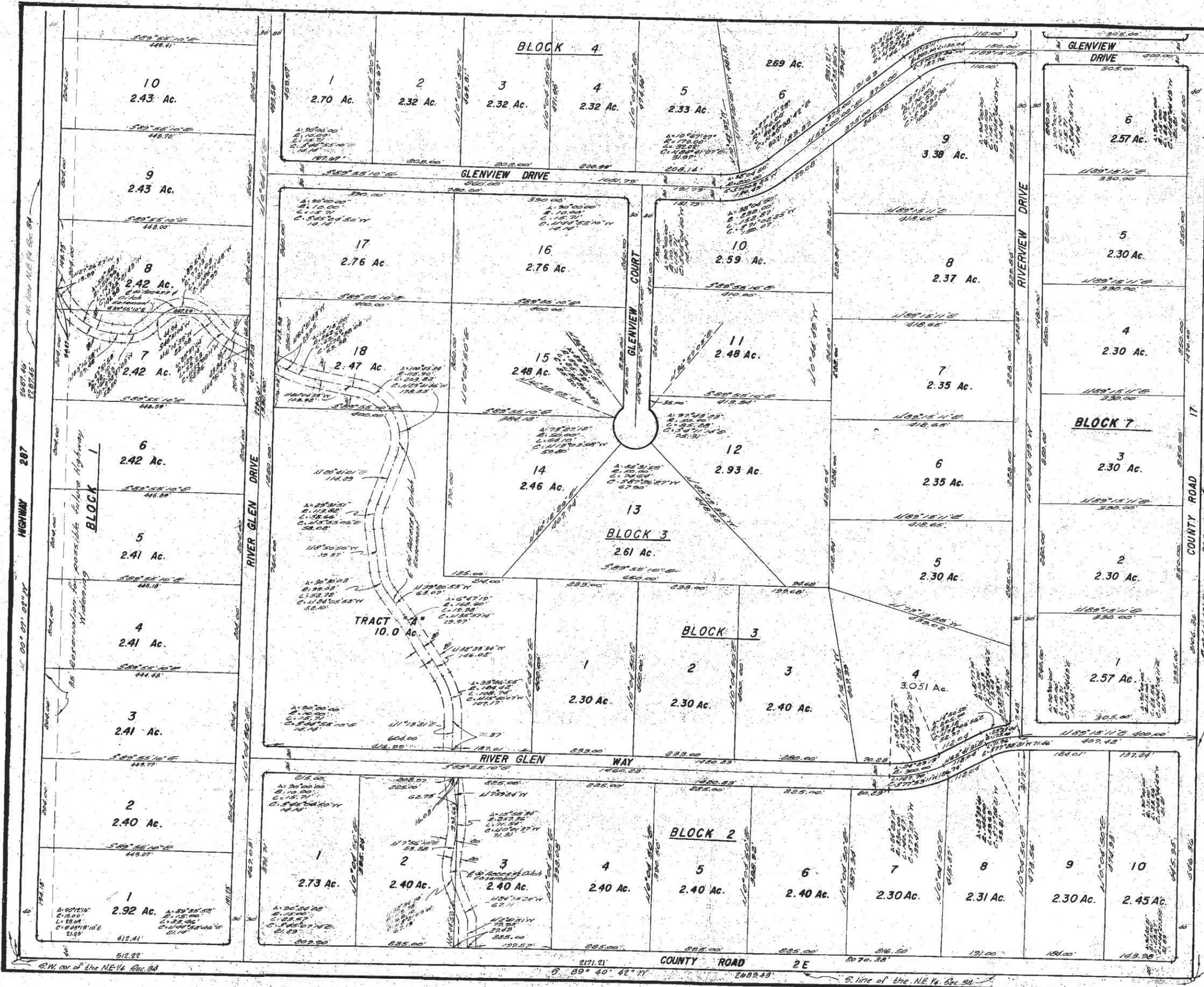
Patricia N. McClain

Notary Public.

2124 BROADWAY
BOULDER, CO 80302

AMENDED PLAT OF RIVER GLEN

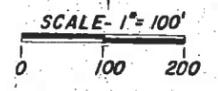
BEING A SUBDIVISION OF A PORTION OF THE SOUTHEAST 1/4 OF SECTION 27 AND THE NORTHEAST 1/4 OF SECTION 34, TOWNSHIP 4 NORTH, RANGE 69 WEST OF THE 6TH P.M., LARIMER COUNTY, COLORADO.



NOTE: LOT AREAS SHOWN ARE GROSS.

NOTE: THERE SHALL BE NO VEHICULAR ACCESS TO HIGHWAY 287.

NOTE: THERE SHALL BE A 30 FOOT UTILITY EASEMENT EACH SIDE OF ALL LOT LINES UNLESS OTHERWISE INDICATED.



I, Rommie E. Hogan, a duly registered land surveyor in the State of Colorado, do hereby certify that this amended plat of River Glen, and correctly surveys the results of a survey made by me or under my direct supervision.

Rommie E. Hogan Colo. P.E. No. 3,485

APPROVALS

Approved by the Larimer County Board of County Commissioners this 27th day of June, A.D. 1974. This approval does not constitute acceptance by highways, alleys or other property.

The County of Larimer assumes no responsibility for the construction, repair or maintenance of the streets, highways, or alleys, or other properties laid out and dedicated hereon.

WITNESSES

Walter R. Johnson
Helen Ann Madden
Clerk of the Board

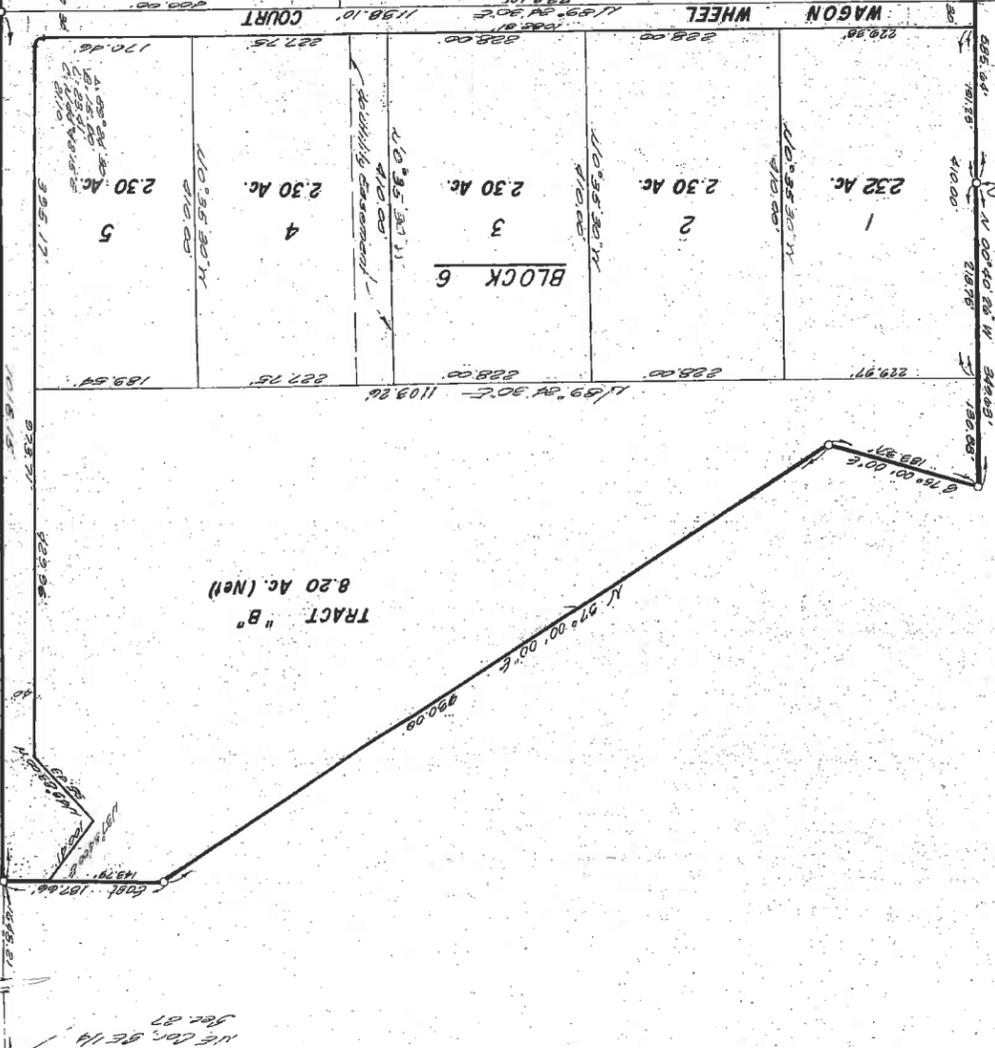
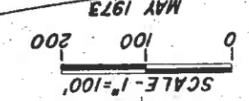
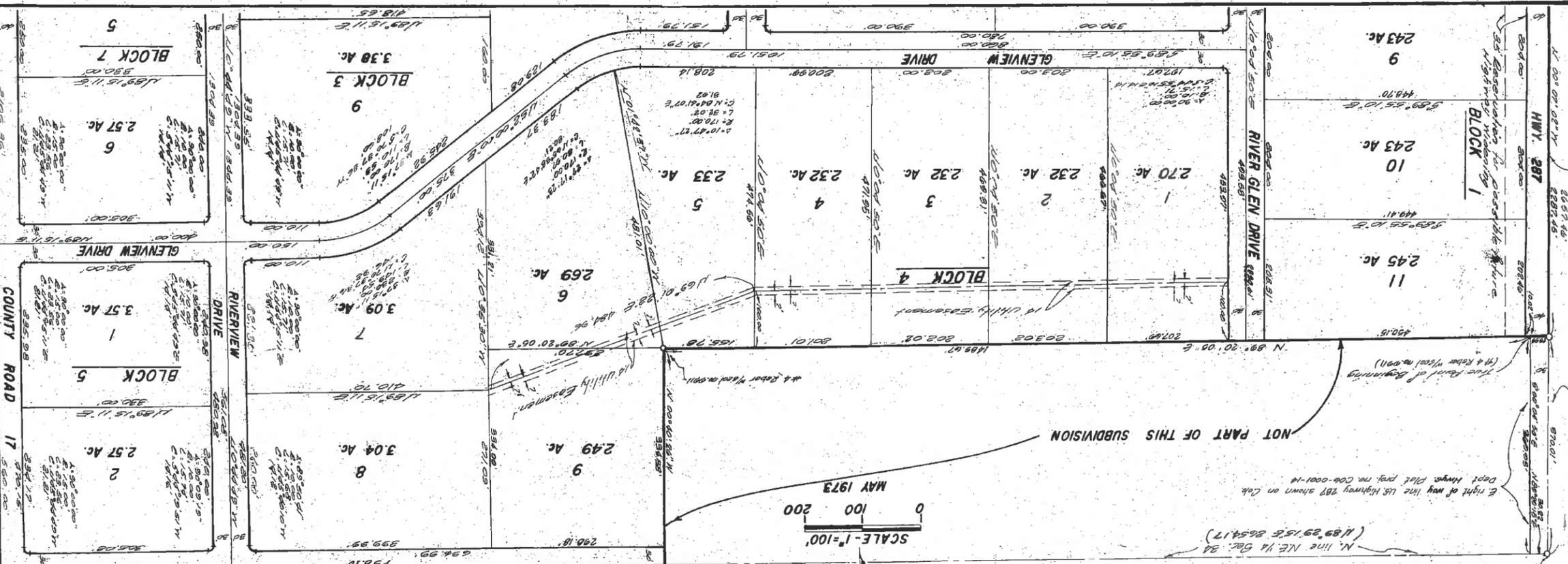
Approved by the Larimer County Health Department this 27th day of June, A.D. 1974. This subdivision is provided with common facilities, namely public water treatment and distribution system, public sewage collection and treatment system. All lots shown hereon, and their improvements and appurtenances thereon shall connect and use these facilities. Construction of sewer and water lines shall meet the requirements of the Colorado Department of Health and the Larimer County Health Department as outlined in the Larimer County Water and Sewer Standards and Procedures Manual. Effluent requirements for sewage treatment shall conform to the current applicable State Laws. The Home Owners Association (or equivalent) shall use and maintain said common facilities in conformance with all applicable laws, rules and regulations.

Arthur L. Bronstein
Clerk of the Board

NOTE: Maintenance of all roads, common areas, and common facilities within this subdivision shall be the responsibility of all property owners within this subdivision through the River Glen Homeowners Association. Failure to adequately maintain these roads shall result in a lien upon the lots affected.

AMENDED PLAT OF RIVER GLEN

BEING A SUBDIVISION OF A PORTION OF THE SOUTHEAST 1/4 OF SECTION 27 AND THE NORTHEAST 1/4 OF SECTION 34, TOWNSHIP 4 NORTH, RANGE 69 WEST OF THE 6TH P.M., LARIMER COUNTY, COLORADO.



NOTE: LOT AREAS SHOWN ARE GROSS.
NOTE: THERE SHALL BE NO VEHICULAR ACCESS TO HIGHWAY 287.
NOTE: THERE SHALL BE A 33 FOOT UTILITY EASEMENT EACH SIDE OF ALL LOT LINES UNLESS OTHERWISE INDICATED.

State of Colorado
County of Boulder
The foregoing instrument was subscribed and sworn to before me this 17th day of June, 1974 by Arthur L. Bronstein, also known as Clara Belle Miller, and John J. Miller.
My Commission expires 11-6-78
Notary Public
John J. Miller

OWNERS:
Glenview Court, a limited partnership
James H. Tull
Arthur L. Bronstein
State of Colorado
County of Boulder
The foregoing dedication was acknowledged before me this 19th day of June, A.D. 1974, by James H. Tull and Arthur L. Bronstein.
My Commission expires 8-30-78
Notary Public
Arthur L. Bronstein

KNOW ALL MEN BY THESE PRESENTS, that the undersigned being the owners of the following described property located in the southeast quarter of section 34 and the northeast quarter of section 27, Township 4 North, Range 69 West, of the 6th Principal Meridian, State of Colorado, more particularly described as follows:
Beginning at the northeast corner of the northeast quarter of said section 34, and considering the west line of the northeast quarter of said section 34 as bearing-south 00°07'02" east and with all bearings contained herein relative thereto; thence along the north line of the northeast quarter of said section 34 north 89°29'19" east 30.22 feet to the east right-of-way line of U.S. Highway 287 as shown on Highway Plat, Colorado Department of Highways, Project No. COE-0001-14; thence along said east right-of-way line south 0°04'50" east 369.93 feet to a number 4 rebar with seal no. 9911; said point being the true point of beginning; thence north 89°20'05" east 1409.67 feet to a number 4 rebar with seal no. 9911; thence north 0°40'26" west 505.66 feet to a number 4 rebar with seal no. 9911; thence continuing north 0°40'26" west 343.63 feet; thence south 75°00'00" east 183.37 feet; thence north 57°00'00" east 930.00 feet; thence east 187.66 feet to a point on the east line of the southeast quarter of section 27, Township 4 North, Range 69 West, north 89°20'05" east 29.99 feet to the true point of beginning; containing 170.63 acres, more or less, have by these presents laid out and surveyed as "amended Plat of River Glen", and do hereby dedicate to and for public use forever hereafter the streets, and convey to the public use forever hereafter the streets, as are laid out and designated on this plat, and do reserve and keep for the use of the public the utility easements for irrigation and drainage facilities, as are laid out and designated on this plat.

APPENDIX F – FINANCIAL INFORMATION AND OPINION OF PROBABLE COST

1. Opinion of Probable Capital Cost
2. Operation and Maintenance Cost
3. Customer Rates
4. Lift Station: 5-year budget
5. 20 year cash flow projections
6. SRF Loan Approval Letter
7. Larimer County Loan Repayment Letter



JVA, Incorporated
 1319 Spruce Street
 Boulder, CO 80302
 Ph: 303.444.1951
 Fax: 303.444.1957

Job Name: River Glen HOA Lift Station

Job Number: 1862.3c

Date: May 2013

By: BLM

5 YEAR BUDGET

RIVER GLEN HOA/ RIVERSIDE FARM FILING 1

YEAR	2014	2015	2016	2017	2018
Reserve:	\$17,051				
Revenues:					
Payment to HOA for Lift Station	\$6,731	\$6,865	\$7,002	\$7,142	\$7,285
Payment to HOA for Town of Berthoud Services	\$51,153	\$55,116	\$59,216	\$65,753	\$67,068
Total Revenues	\$57,884	\$61,981	\$66,219	\$72,895	\$74,353
PER LOT PER MONTH	\$68	\$69	\$70	\$71	\$72
Expenses:					
Liability Insurance	\$750	\$765	\$780	\$796	\$812
Pollution Insurance	\$4,000	\$4,080	\$4,162	\$4,245	\$4,330
Mowing	\$650	\$663	\$676	\$690	\$704
Miscellaneous	\$250	\$255	\$260	\$265	\$271
Office, postage	\$225	\$230	\$234	\$239	\$244
Water	\$335	\$342	\$349	\$356	\$363
Addition to Reserves	\$200	\$204	\$208	\$212	\$216
Sub Total 1	\$6,410	\$6,538	\$6,669	\$6,802	\$6,938
<u>Berthoud Fees</u>					
<i>Number of Taps</i>	71	75	79	86	86
<i>4,000 gallons per tap assumed</i>					
Annual Base Fee	\$23,055	\$24,841	\$26,689	\$29,635	\$30,228
Annual Processing Fee	\$22,254	\$23,978	\$25,762	\$28,606	\$29,178
Annual Maintenance Fee	\$3,408	\$3,672	\$3,945	\$4,381	\$4,468
Sub Total 2	\$48,717	\$52,491	\$56,397	\$62,622	\$63,874
Total Expenses	\$55,127	\$59,029	\$63,066	\$69,424	\$70,812

Inflation rate 2%

Note: Town of Berthoud is responsible for all costs of operation and maintenance including repairs and replacements



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CUSTOMER RATE SUMMARY

Customer	Annual SRF Repayment Fee	Annual Tax
All platted lots (River Glen HOA and Riverside Farm Filing 1 HOA)	Annual SRF repayment	\$881.89
Customer	Monthly Expense Description	Monthly Expense Amount
All active connections (River Glen HOA and Riverside Farm Filing 1 HOA)	Town of Berthoud Monthly Fee	\$60.04
	Miscellaneous Lift Station Operation Expense	\$7.00
	Customer Monthly Fee	\$67.04

CUSTOMER RATE CALCULATIONS

Line	Description	Value	Unit	Note
Step 1: SRF Loan Repayment				
*SRF Loan will be repayed by all platted lots in the River Glen and Riverside Farm Filing 1 subdivisions as a separate, annual tax to Larimer County				
1	Annual repayment amount =	\$75,084.02		
2	Total number of platted lots =	86		
3	Larimer County Processing Fee =	8.82 per lot per year		
4	Annual payment per lot =	\$881.89 per year per lot		= (Annual repayment amount / Number of Platted Lots) + Larimer County Processing Fee
Step 2: Town of Berthoud Monthly Fees				
*Berthoud monthly fees will be paid by all ACTIVE connections in the Riverside Farm Filing 1 and River Glen Subdivisions				
Step 2a: Town of Berthoud TREATMENT Fees				
5	Monthly service fee =	\$27.06 per connection		(From "Agreement to provide residential sewer service")
6	Processing fee =	\$6.53 per 1,000 gallons		(From "Agreement to provide residential sewer service")
7	1,000 gallons per active connection =	4		Engineer's Estimate
8	Monthly treatment fee per connection =	\$53.18 per connection		= (Monthly Base Fee) + (Use fee x Amount of 1,000 gallons per connection)
Step 2b: Town of Berthoud LIFT STATION O&M Fees				
9	Monthly base fee =	\$4.00 per connection		(From operations and maintenance agreement)
10	Monthly Lift Station O&M Fee =	\$4.00 per connection		= (Monthly Base Fee)
11	Total Town of Berthoud Monthly Fee =	\$57.18 per connection		= Monthly Treatment Fee per Connection + Monthly Lift Station O&M Fee per Connection
12	Rate Adjustment =	\$60.04 per connection		= Total Town of Berthoud Monthly Fee x 5% coverage ratio
Step 3: HOA Lift Station				
13	Annual Liability Insurance =	\$750.00		Per River Glen HOA
14	Annual Pollution Insurance =	\$4,000.00		Per River Glen HOA
15	Mowing =	\$650.00		Per River Glen HOA
16	Miscellaneous =	\$250.00		Per River Glen HOA
17	Office, postage =	\$225.00		Per River Glen HOA
18	Water =	\$335.00		Per River Glen HOA
19	Addition to Reserves =	\$200.00		Per River Glen HOA
20	Annual Miscellaneous Lift Station Expense =	\$6,410.00 per year		= Sum of #11 - #16
21	Annual Miscellaneous Lift Station Expense Per Lot =	\$74.53 connections		= Annual Miscellaneous Expense/ 86 lots
22	Monthly Miscellaneous Lift Station Expense Per Lot =	\$6.21 per month		= Annual Miscellaneous Expense per lot/ 12 months
23	Rate Adjustment =	\$6.52 per connection		= HOA Lift Station Income x 5% coverage ratio



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Job Number: 1862.3c

Date: May 2013

By: BLM

Opinion of Probable Cost			
Force Main to Dry Creek Connection			
River Glen HOA			
	Quantity	Units	Unit Cost
			Total
Division - 02 General Sitework			
Erosion Control	1	LS	\$13,000
Seeding and Landscaping	1	LS	\$3,000
Asphalt Road Patch/Replacement	100	LF	\$15
Force Main (4" HDPE)	5,148	LF	\$25
Sanitary Sewer Line (8" PVC SDR 35)	1,000	LF	\$40
Removal of lagoons and berms: solids disposal	1	LS	\$25,000.00
Removal of lagoons and berms: site grading	2000	CY	\$2.25
General Sitework Subtotal			\$215,700
Division - 03 Concrete			
Manholes	8	EA	\$4,000
Concrete Subtotal			\$32,000
Division - 11 Equipment			
Lift Station Modification: replace pumps, controls, building improvement	1	LS	\$80,000
Equipment Subtotal			\$80,000
Division - 16 Electrical			
Electrical	1	LS	\$8,000
Generator w/ ATS	1	LS	\$15,000
Upgrade to Three Phase Power	1	LS	\$20,000
Electrical Subtotal			\$43,000
Bore			
Directional Drill: Little Thompson River Crossing	100	LF	\$100
Directional Drill: West Country Road 4e	100	LF	\$100
Bore Subtotal			\$20,000
Subtotal			\$390,700
Contingency (20%)			\$78,100
Contractor's OH&P (15%)			\$70,300
Permitting, Design And Construction Admin(15%)			\$80,900
Construction Capital Total			\$620,000
Miscellaneous Costs			
Berthoud WWTF Tap fee	86	EA	\$6,285
Miscellaneous Subtotal			\$540,500
Grand Total			\$1,160,500



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Operation & Maintenance Projections

Year	n	Annual Cost	2013 PW
2013	0	\$ 54,900	\$ 54,900
2014	1	\$ 56,200	\$ 54,563
2015	2	\$ 60,400	\$ 56,933
2016	3	\$ 64,700	\$ 59,210
2017	4	\$ 71,400	\$ 63,438
2018	5	\$ 73,100	\$ 63,057
2019	6	\$ 74,800	\$ 62,644
2020	7	\$ 76,500	\$ 62,202
2021	8	\$ 78,200	\$ 61,732
2022	9	\$ 80,000	\$ 61,313
2023	10	\$ 81,900	\$ 60,941
2024	11	\$ 83,800	\$ 60,539
2025	12	\$ 85,700	\$ 60,108
2026	13	\$ 87,700	\$ 59,719
2027	14	\$ 89,700	\$ 59,302
2028	15	\$ 91,700	\$ 58,859
2029	16	\$ 93,800	\$ 58,453
2030	17	\$ 96,000	\$ 58,082
2031	18	\$ 98,200	\$ 57,682
2032	19	\$100,500	\$ 57,314
2033	20	\$102,800	\$ 56,918
20 Year O&M (2013PW) =			\$ 1,248,000
Salvage Value =			\$ -
Total Present Worth =			\$ 1,248,000

Given:

Inflation (I) = 2.30%
 Interest (i) = 3.00%

$$\text{Annual Cost} = (\text{Sum of costs}) \times (1 + I)^n$$

$$\text{2012 PW} = (\text{Annual Cost}) \times (1 + i)^{-n}$$

Berthoud WWTF fees:

\$27.06 per month, per active connection
 \$6.53 per month, per 1000 gallons

Assume: 4 1000 gallons/connection

Berthoud Lift Station O&M Fee:

\$4.00 per month, per active connection

$$\text{MONTHLY CHARGE} = (\$27.06 \times \text{Taps}) + ((\$6.53 \times 4 (1000 \text{ gallons/connection})) \times \text{Taps}) + (\$4.00 \times \text{Taps})$$

Annual Lift Station O&M Costs (Excluding Berthoud Fees)	
Liability Insurance	\$ 750
Pollution Insurance	\$ 4,000
Mowing	\$ 650
Miscellaneous	\$ 250
Office, postage	\$ 225
Water	\$ 335
Total	\$ 6,210



ENGINEERING DEPARTMENT

Post Office Box 1190
Fort Collins, Colorado 80522-1190

(970) 498-5700
FAX (970) 498-7986

May 10, 2013

Dear Larimer County Local Improvement District 2012-1 (River Glen) Property Owner:

On Thursday, May 9th, 2013, the Larimer County Board of Commissioners adopted a resolution that approved the assessments for the Larimer County Local Improvement District 2012-1 (River Glen).

Your assessment is \$14,276 for the parcel of land you own.

The assessments may be paid in full, interest free, to the Engineering Department on or before June 9, 2013. If you choose not to pay in full by this date, the assessments may be paid in installments with interest and collection costs to the County Treasurer.

If you elect to pay in installments, the assessments shall be payable in twenty (20) substantially equal annual amortized installments of principal, interest and County Treasurer collection costs, beginning in 2014 and in each year thereafter until paid in full, with the last payment due in 2033. The times of payment of installments shall be the same as the times of payment for installments of property taxes as specified in §39-10-104.5 (2), C.R.S. Interest shall accrue on unpaid installments of principal at the rate of 2.00% per annum from and including December 31, 2013 until paid in full. The owner of any property not in default as to any installment or payment may, at any time, pay the whole of the unpaid principal with the interest accruing to the maturity of the next installment of interest or principal.

If you elect to pay in installments, the annual re-payment will be \$ 873.07 for the next twenty years plus collection costs to the County Treasurer totaling \$881.89.

If you do not choose to pay the assessment in full during the interest free period, you do not need to respond. Just wait for your tax bill to arrive in the mail in January 2014. If you choose to pay in full, please mail your payment to the **Larimer County Engineering, PO Box 1100, Fort Collins, Colorado 80522.**

Sincerely,

Linda Sanders
Business Operations Supervisor



COLORADO WATER RESOURCES & POWER DEVELOPMENT AUTHORITY

Logan Tower Bldg – Suite 620, 1580 Logan Street, Denver, Colorado 80203-1942
303/830-1550 · Fax 303/832-8205 · info@cwrpda.com

March 4, 2013

Ed Schemm
Larimer County LID-River Glen Estates
1525 Blue Spruce Dr.
Fort Collins, CO 80524

Re: Water Pollution Control Revolving Fund (“WPCRF”) Loan Approval

Dear Mr. Schemm:

On March 1, 2013, the Board of Directors of the Colorado Water Resources and Power Development Authority approved the Larimer County LID-River Glen for a \$1,240,000 WPCRF direct loan. The loan is for a term of 20 years at an interest rate of 2%. The loan was approved with the following conditions:

1. The District shall execute an intergovernmental agreement with the Town of Berthoud, to the satisfaction of Authority staff and its general counsel, prior to loan execution.

We look forward to working with you and your attorneys towards a successful loan closing. Please call me at (303) 830-1550, extension 23 or email me at squinn@cwrpda.com with any questions.

Sincerely,

A handwritten signature in black ink, appearing to read 'Shanna Quinn', written in a cursive style.

Shanna Quinn
Financial Analyst

CC: Jeannine Haag, General Counsel, (via email)
Kim Crawford, Bond Counsel, (via email)
Louanna Cruz, WQCD, (via email)

APPENDIX G – PUBLIC MEETING INFORMATION AND SITE LOCATION SIGN POSTING

Agenda For Sewer Workgroup Report and Alternatives Review February 23, 2012- 7 PM - Berthoud Community Center

Objective of Meeting- Sewer Workgroup report to homeowners and River Glen HOA Board on:

- Current information regarding sewer issues and their scope
- Review the preliminary engineering and cost estimates for options to address sewer permit and plant issues
- Overview actions needed and estimated timelines
- Answer questions about sewer options and actions
- Obtain feedback from homeowners on their preferred option to address sewer issues

AGENDA

7 PM

1. Introductions and review of process and purpose of this meeting.
2. Presentation by Colorado Department of Health - General Topics covered:
 - a. Why continuing current operation is not a viable option for future
 - b. Permit requirements
 - c. Consequences of failing to meet permit requirements
 - d. Speculation on future discharge requirements
3. Report on Preliminary Engineering- JVA (see mailed packets for copies of background material)
4. Review of funding current funding by HOA and future actions related to funding.
 - a. HOA funds used to date
 - b. Loans
 - c. Grant applications and homeowner participation
5. Review of timeline, actions and process from today forward.
 - a. CO Health Department permit dates
 - b. Development district, loan and election
 - c. New agreement between River Glen and Riverside Farms
6. Homeowner questions and answer period-
 - a. Sewer workgroup and Ed Schemm and Linda Sanders from Larimer County and JVA staff will be present to address questions
7. Sewer Workgroups recommendations on the alternatives.
8. Homeowner alternative input-
 - a. Review tonight's process the Sewer workgroup is using to obtain homeowners input on sewer alternatives
 - b. Input on independent engineer
9. Period for homeowner Input

9 PM Vacate Community Center

RGHOA Waste Plant Meeting Minutes
02/23/12

Meeting opened @7:00 p.m.

Bob Towry introduced speakers from the JVA Group, Larimer County, waste plant committee, and the purpose of meeting.

General topics were covered by Colorado Department of Health, including permit requirements, Failure to meet, and future discharge requirements.

A report on preliminary engineering took place by JVA, reviewing information previously mailed out to homeowners, with an overview of the four alternatives..

A review of current funding by HOA, loans and grant applications took place.

Timelines were discussed regarding CO Health Department permit, Development district, loan, election, and new agreement between River Glen and Riverside Farm.

A question and answer period took place between homeowners, Sewer committee, Larimer County and JVA staff.

The Sewer Work Group gave recommendations on the alternatives

There was an overview of a homeowner's suggestion to hire an independent engineer to represent the HOA in sewer plant process.

After further questions and answers, the quorum in attendance favored alternative #2

Meeting was adjourned @9:04 p.m.

Respectfully submitted,

Denise Vigil

Denise Vigil
RGHOA Secretary

Sign-in Sheet
 River Glen HOA Wasteplant Meeting
 2/23/12

Name	Address	Email
<u>Diane & Steve</u>	<u>1448 River Glen</u>	<u>robert@bill.comcast.net</u>
<u>Lynn & Sandy Harpore</u>	<u>1902 Glenview Ct,</u>	<u>Sondrahtg@comcast.net</u>
<u>Carole Fitzgerald</u>	<u>186 Rindler</u>	
<u>MARK KIMON McGEE</u>	<u>1721 Riverside Dr</u>	
<u>KORPORATION WEN</u>	<u>1520 W. 15th St</u>	
<u>Phil Vaughan</u>	<u>2033 River Glen</u>	<u>billus@vaughan.comcast.net</u>
<u>Steve Moore Frady</u>	<u>403 Wagon Wheel Ct</u>	
<u>Dawn Cooper</u>	<u>1320 Glenview Dr</u>	
<u>Paul Simpson</u>	<u>1810 Glenview Ct</u>	<u>simple & comcast.net</u>
<u>Tom Flock</u>	<u>417 Wagon Wheel</u>	<u>EFlock@comcast.net</u>
<u>Bill Bowles</u>	<u>10 Argon + dunt</u>	<u>B.Bowles@coloradocomcast.net</u>
<u>Bob & Carol Lopez</u>	<u>1232 Wagon Wheel</u>	<u>Lopez@comcast.net</u>
<u>Ed Bruce</u>	<u>1420 Glenview</u>	<u>E-Bruce@comcast.net</u>
<u>Ken & Kim Carpenter</u>	<u>1116 Wagon Wheel</u>	<u>Krcarp@comcast.net</u>
<u>Richard Saxton Tracy</u>	<u>2009 Riverside Dr</u>	
<u>Julia Rogers</u>	<u>1113 Riverside Dr</u>	<u>JRogers@comcast.net</u>
<u>CARL EDWARDS</u>	<u>1809 River Glen Dr</u>	<u>meadows@comcast.net</u>
<u>JAN MILES</u>	<u>1232 Wagon Wheel</u>	<u>JMiles@comcast.net</u>
<u>Simon Philips</u>	<u>1901 Riverside Drive</u>	<u>Trax4@comcast.net</u>
<u>Dave Steffen</u>	<u>1716 Riverside Drive</u>	<u>kd-physis@comcast.net</u>
<u>Tom Bieri</u>	<u>1705 Riverside Dr</u>	<u>JBieri@comcast.net</u>
<u>Carol Olson</u>	<u>1288 Wagon Wheel Ct</u>	<u>carololson@comcast.net</u>
<u>Jane Johnson</u>	<u>317 River Glen Way</u>	<u>jh.johnson@comcast.net</u>
<u>TOM BULL</u>	<u>1821 River Glen Dr</u>	<u>Bull@comcast.net</u>
<u>Debbie Drake</u>	<u>1221 Riverside Dr</u>	<u>Debbie@comcast.net</u>
<u>Mary Dawn</u>	<u>1279 Riverside Dr</u>	<u>mdawn@comcast.net</u>
<u>Michael Brown</u>	<u>2109 Wagon Wheel</u>	<u>MBrown@comcast.net</u>
<u>Daryl Musser</u>	<u>2008 Riverside Dr</u>	<u>dmusser@comcast.net</u>
<u>Conny Sheard</u>	<u>2023 Riverside Dr</u>	<u>sheard@comcast.net</u>
<u>Fabie Pivetti</u>	<u>1448 Wagon Wheel</u>	<u>pivetti@msu.edu</u>
<u>Janet Johnson</u>	<u>1805 " "</u>	
<u>Steve Johnson</u>	<u>1448 Wagon Wheel</u>	
<u>Julie Joppi</u>	<u>1504 Glenview Dr</u>	
<u>Debbie Vigil</u>	<u>1105 River Glen Way</u>	

30 - River Glen
 2 - Riverside Farms
 7 - Riverside Dr

**NOTICE OF PROPOSED
LIFT STATION**

NOTICE IS HEREBY GIVEN THAT THE PROPERTY UPON WHICH THIS SIGN IS POSTED SHALL BE CONSIDERED FOR THE CONSTRUCTION OF A LIFT STATION. ADDITIONAL INFORMATION MAY BE OBTAINED BY CONTACTING RIVER GLEN HOMEOWNERS ASSOCIATION (MIKE DOWER, 970.532.4353) OR THE COLORADO DEPARTMENT OF PUBLIC HEALTH AND ENVIRONMENT, WATER QUALITY CONTROL DIVISION, (303) 692-3500.

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