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Comments Due Date: November 4, 2017

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FINDING OF NO SIGNIFICANT IMPACT (FONSI)
Richmond Utilities Regional Facilities Plan: Planning Period 2017 – 2037
City of Richmond, Madison County, Kentucky
AI ID: 44333; PLN20170001

The Department for Environmental Protection, Division of Water (DOW) has conducted a review of the above proposed project in accordance with the procedures contained in the State Revolving Fund Operating Agreement between the Environmental Protection Agency Region IV and the Commonwealth of Kentucky. Based on a review of the **Richmond Utilities Regional Facilities Plan** submitted by the applicant and other supporting documents, the DOW has determined the above referenced proposed project will not have a significant impact on the environment and is issuing a Finding of No Significant Impact (FONSI).

The **Richmond Utilities Regional Facilities Plan** proposes projects to include expanding the existing Otter Creek Wastewater Treatment Plant (WWTP) capacity to meet more stringent permit limitations and eliminating the KPDES discharge at the Silver Creek WWTP. Flows would be conveyed through the existing conveyance system to the Otter Creek WWTP with the Silver Creek WWTP serving as an equalization basin.

Based on the evaluation of alternatives, the selected alternative for the Otter Creek WWTP is to expand its capacity by installing additional oxidation ditches. This alternative could be easily accomplished as the piping associated with these improvements and grading was completed in the 2007 construction of the facility. The Silver Creek WWTP KPDES discharge will be eliminated and flow conveyed to the Otter Creek WWTP. Projects at the Otter Creek WWTP will include the addition of two Enhanced Biological Nutrient Removal (EBNR) systems and two additional clarifiers; a new influent splitter box to divert flows to the EBNR systems; two new WEMCO influent pumps and controls to convey additional flow to the headworks of the facility; two new EBNR systems including anaerobic selector basins, anoxic basins, and appurtenances; two new circular clarifiers and appurtenances; one new clarifier splitter box; and, yard piping modifications. Projects at the Silver Creek WWTP will include installation of a new pump and a 16-inch force main built that will discharge into a diversion manhole located at the Pavilion #1 Pump Station on Duncannon Road. Implementation of Phase I of this alternative will divert as much as 2.25 MGD to Otter Creek WWTP with Phase II diverting an additional 2.25 MGD.

The selected alternative will proceed in phases with the first phase giving preliminary probable project costs of \$9,473,900. Phase 2 (3-10 years) costs are projected to be approximately \$19,763,725. Phase 3 (11-20 years) costs are projected to be approximately 7,293,100.



These actions are a necessary step in improving water quality of local streams, as well as improving the ability of the system to meet permit limits due to aging and failing infrastructure. The proposed projects are located within three major watersheds: Muddy Creek-Kentucky River watershed, Hydrologic Unit Code (HUC) 10 number 0510020501; Silver Creek watershed, HUC 10 number 0510020502; and, Paint Lick Creek-Kentucky River watershed, HUC 10 number 0510020503.

Attached is a State Planning and Environmental Assessment Report (SPEAR) containing detailed information supporting this proposed action. It includes the following sections: A) Summary, B) Existing Environment, C) Existing Facilities, D) Need for Project, E) Alternatives Analysis, F) Environmental Consequences, Mitigative Measures, G) Public Participation and User Rates, and H) Sources Consulted.

This FONSI and environmental assessment will be available for review and comment for thirty (30) calendar days. Interested persons are encouraged to submit comments within thirty days of the issue date. The DOW will take no action on this project until after the review and public comment period has ended, and will evaluate all comments before a decision is made to proceed with approval of the wastewater facilities plan or awarding of SRF funds for this project. Written comments supporting or disagreeing with the proposed action should be sent to Russell Neal, Supervisor, Wastewater Municipal Planning, Water Infrastructure Branch, Division of Water, 300 Sower Boulevard, Frankfort, Kentucky, 40601, or by e-mail to russell.neal@ky.gov.

Sincerely,

A handwritten signature in black ink, appearing to read "Peter T. Goodmann", written over a faint circular stamp.

For
Peter T. Goodmann, Director
Division of Water

RN/RN

STATE PLANNING AND ENVIRONMENTAL ASSESMENT REPORT (SPEAR)
City of Richmond, Madison County, Kentucky
AI#44333; PLN20170001

A. Summary

Project Summary

The City of Richmond is located in Madison County, Kentucky. It is served by the Bluegrass Area Development District and the Division of Water's Frankfort Regional Office. The wastewater treatment and collection facilities are owned by Richmond Utilities Board and engineering services are provided by Howard K. Bell, Consulting Engineers, Inc.

Richmond Utilities is pursuing to increase capacity in the Silver Creek drainage area and expand its current collection service in the planning area. The Facilities Plan will provide guidance for construction of treatment facilities, trunk sewers, and pump stations to be phased in over a 20-year planning period through 2036. Population in the planning area is projected to increase to 68,831 by 2036, based on interpolated 2010 census data.

Richmond Utilities proposes to expand the existing Otter Creek Wastewater Treatment Plant (WWTP) capacity from 8.0 million gallons per day (MGD) average daily flow (ADF) to 12 MGD ADF with a 36 MGD peak daily flow (PDF) by adding two enhanced biological nutrient removal (EBNR) systems as well as two additional clarifiers to the existing treatment facility. The KPDES discharge from the Silver Creek WWTP will be eliminated with flows conveyed through the existing conveyance system to the Otter Creek WWTP. The Silver Creek WWTP would serve as an equalization basin.

Phase 1 (0-2 years):

The initial Phase of this project will eliminate the KPDES discharge at Silver Creek wastewater treatment plant and convey flows through the existing system to Otter Creek WWTP. Approximately 2.25 MGD will be diverted along Taylor Fork to the Wilgreen pump station. Approximately 8,000 linear feet (LF) of 15-inch outfall sewer is proposed in the Silver Creek sewer area. Within the Lancaster Road area served by Otter Creek WWTP, trunk sewer improvements include the installation of approximately 3,500 LF of 15-inch sewer. The current Motel 6 pump station will also be replaced with a new submersible style pump station. The total estimated project cost for Phase I is \$9,473,900.

Phase 2 (3-10 years):

The second Phase of this project involves expanding the Otter Creek wastewater treatment plant with the addition of two EBNR systems and two clarifiers, increasing its rated capacity from 8 MGD ADF to 12 MGD ADF. Within the Otter Creek Sewer Area, outfall sewer line improvements are proposed in the Wilderness Trail and Lost Fork areas and include the installation of approximately 2,300 LF of 8-inch and 7,800 LF of 12-inch sewer pipe, 1,750 LF of 8-inch and 1,800 LF of 10-inch force main. Two pump stations, 500 GPM and 350 GPM, will be installed on the West Fork and a tributary of the West Fork, respectively. Two pumps stations will be eliminated and one upgraded to 500 GPM along South Robert R. Martin By-pass.

Approximately 15,000 LF of 8-inch gravity sewer will be installed in order to eliminate the two pump stations. Approximately 7,500 LF of 8-inch relief sewer is proposed in the Taylor Fork area which will pick up wastewater presently treated at the Brocklyn WWTP.

Within the Silver Creek Outfall Sewers, approximately 5,700 LF of 10-inch sewer will be constructed in the Duncannon Road and I-75 areas. Two pump stations will be installed in these areas as well; both rated at 300 GPM, along with 7,100 LF of 6-inch force main. In North Duncannon Road Area, approximately 6,200 LF of 2-inch and 3,700 LF of 8-inch sewer lines will be installed. A new pump station with a capacity of 300 GPM is also proposed along with 1,500 LF of force main. In the Parrish Road area, 3,500 LF of 10-inch outfall sewer will be constructed along an un-named tributary of Harts Fork. The total estimated project cost for Phase II is \$19,763,725.

Phase 3 (11-20 years):

Approximately 16,400 LF of 8-inch to 18-inch outfall sewer, 3,500 LF of 12-inch force main, and a new pump station are proposed to be constructed in the Lower West Fork sewer system, currently serviced by Otter Creek WWTP. An additional 21,000 LF of 15-inch outfall sewer will be constructed in the Hays Fork area currently served by Silver Creek WWTP. Completion of this outfall sewer will allow the Army Depot plant to be decommissioned. A new pump station and 12,000 LF of 8-inch force main will be installed in the Old Town Branch area as well. The total estimated project cost for Phase III is \$7,293,100.

Funding Status

The City of Richmond estimates the total cost for all phases of the plan to be \$36,530,725. The cost will be adjusted once construction costs are known through the bidding process. The City will pursue funding the majority of the cost through the issuance of Revenue Bonds and/or obtaining a government loan through the Clean Water State Revolving Fund program.

B. Existing Environment

Topography

Madison County is located in the east-central Bluegrass Region of Kentucky. The city of Richmond is the county seat and is located on Interstate -75 (I-75), approximately 25 miles south of Lexington. Topography within the planning area is predominantly moderate to heavily rolling, with numerous steeply sloped hills and valleys.

Soils

The planning area consists of three major soil associations: Shelbyville-Mercer-Nicholson Lowell-Faywood-Cynthiana Rock Outcrop, and Beasley-Brassfield-Otway. The Shelbyville-Mercer-Nicholson Association is located in the central portion of the planning area and is encompassed by the Lowell-Faywood-Cynthiana Rock Outcrop Association in a horseshoe pattern. The Beasley-Brassfield-Otway Association exists largely in the northeastern

portion of the planning area with two smaller areas southward. These soils are well-drained but unsuitable for on-site wastewater disposal due to their slow permeability and often steep slopes.

Geology

Just below the soil in the planning area is cap rock consisting of consolidated, sedimentary rock formed by deposits of marine sediments from the inland sea that covered Kentucky during the Upper Ordovician Age. The rolling upland areas in the central portion of the planning area contain cap rock composed of interbedded limestone and shale or a fine-grained silty-clay limestone. Cap rock in adjacent areas is composed of intermixtures of limestone, shale, and siltstone. Aquifers located in the eastern and southern portions of the planning area typically produce domestic water supplies of about 100 gallons per day. If the aquifer is located in a valley, the supply of water is usually inadequate to continually supply households located on uplands and ridges.

Aquifers in the Maysville group of limestone, located in the northern portion of the planning area, can produce between 100 to 500 gallons of water per day, with lesser yields in upland areas. Groundwater of this formation tends to contain high concentrations of hydrogen sulfide.

Aquifers in the southern portion of the planning area generally produce similar amounts of water with high concentrations of hydrogen sulfide. As a result, The City of Richmond obtains its municipal water supply from the Kentucky River.

Surface Waters

The planning area is located within the Kentucky River Basin Management Unit. There are no priority watersheds in the planning area. There are four major waterways in the planning area including Otter Creek, Silver Creek, Tates Creek, and Muddy River and all serve as tributaries to the Kentucky River. There are also three water impoundment reservoirs created primarily for water supply as well as other purposes, in the planning area. Lake Reba, located in Muddy Creek Watershed (HUC10 0510020501), is owned by the City of Richmond and is used as a secondary water supply source and for recreational purposes. Wilgreen Lake is located in Silver Creek Watershed (HUC10 0510020502), is owned by the state, and used for preservation purposes. The third is an impoundment located on the grounds of Arlington Golf Course in Paint Lick Creek Watershed (HUC10 0510020503) and serves as a water supply for the golf course. Also located in this watershed are Lake Buck and Lake Gem. Several waterbodies within the planning area are impaired and therefore listed in the *Integrated Report to Congress of Water Resources in Kentucky, 2014* (Table 1).

Table 1
List of Impaired Rivers, Streams, and Creeks
Kentucky River Watershed
Madison County, Kentucky

Water Body & Segment	Support Status*	Designated Use**	Causes	Sources
Kentucky River RM 153.75 - 209.8	FS	WAH		
	PS	FC		
	FS	PCR	Mercury in Fish Tissue	Unknown
	FS	SCR		
	FS	DWS		
Lake Reba	PS	WAH	Dissolved Oxygen, Nutrient/ Eutrophication	Golf Courses, Unspecified Urban Stormwater
	FS	SCR	Biological Indicators	
Wilgreen Lake	PS	SCR	Dissolved Oxygen, Nutrient/ Eutrophication Biological Indicators	Non-irrigated Crop Production, On-site Treatment Systems, Livestock
Harts Fork RM 3.1 - 4.1			Designated use has not been assessed	
Muddy Creek RM 0 - 20.6	FS	WAH		
	NS	PCR		
	FS	FC	<i>E. coli</i>	Livestock
	FS	OSRW		
Muddy Creek RM 20.6 - 31.3	NS	WAH	<i>E. coli</i> , Sedimentation/ Siltation	Loss of Riparian Habitat, Package Plant, Streambank Modifications/destabilization
	NS	PCR		
Otter Creek RM 0 - 4.1		WAH		
	FS	PCR	None	None
		SCR		
		FC		
Silver Creek RM 0 - 11.1		WAH		
	FS	PCR	None	None
		SCR		
Silver Creek RM 11.1 - 29.8	NS	WAH	Sedimentation/Siltation	Loss of Riparian Habitat, Managed Pasture Grazing, Non-irrigated Crop Production, Post-development Erosion & Sedimentation
Tate Creek RM 0 - 6.5	NS	WAH	Nutrient/Eutrophication Biological Indicators, Organic Enrichment Biological Indicators	Municipal Point Source Discharges, Livestock, Crop Production
Tate Creek RM 6.5 - 11.5	FS	WAH	None	None
		PCR		
West Fork Otter Creek RM 0 - 2.8	FS	WAH	None	None

Source: *Integrated Report to Congress on the Condition of Water Resources in Kentucky, 2014* (305(b) and 303(d))

*NS = Non-Support, PS = Partial Support, FS = Full Support **WAH = Warmwater Aquatic Habitat, CAH = Coldwater Aquatic Habitat, PCR = Primary Contact Recreation, SCR = Secondary Contact Recreation, FC = Fish Consumption

Groundwater

The groundwater in Madison County is hard to very hard and may contain salt or hydrogen sulfide at depths greater than 100 feet. In the planning area, bedrock layers consisting of dolomite, limestone, and shale and Limestone formations containing high concentrations shale, siltstone, and mudstone, are conducive to poor groundwater aquifers.

Groundwater obtained from most drilled wells and some springs indicates presence of hardness (CaCO₃) as well as iron, sulfates, salt and manganese. This is a result of strip mining and old abandoned oil and gas wells. All of the planning area lies within a moderate groundwater sensitivity region indicating contaminants may move into, within, and through the groundwater system.

C. Existing Facilities

Wastewater Treatment Plants:

Otter Creek WWTP is located on Red House Road (KY 388) northeast of the City of Richmond. The plant was constructed to its present capacity of 8 MGD. Its average daily flow from January 1, 2015 to December 31, 2016 was 4.9 MGD. Facilities consist of influent pumping, screening, biological phosphorous removal, oxidation ditches, secondary clarification, ultraviolet disinfection, post aeration, and effluent flow metering prior to discharge. Effluent is discharged to Otter Creek, a tributary of the Kentucky River, at mile point 8.55. Discharge limits are established through KPDES permit number KY0107107 as presented in Table 2.

Table 2 KPDES Permit Limitations Otter Creek Wastewater Treatment Plant		
Parameter	Monthly	Weekly
Carbonaceous Biochemical Oxygen Demand (CBOD ₅)	20 mg/l	30 mg/l
Percent Removal CBOD ₅	85%	NA
Total Suspended Solids (TSS)	30 mg/l	45 mg/l
Percent Removal TSS	85%	
Ammonia-Nitrogen (as NH ₃ N)		
	May 1 - October 1	4 mg/l
	November 1 - April 30	10 mg/l
Escherichia coli	130 colonies/100 ml	240 colonies/100 ml
Dissolved Oxygen (DO)	7.0 mg/l minimum	
pH (Standard Units)	6.0 minimum, 9.0 maximum	
Total Phosphorous	1.0 mg/l	2.0 mg/l

A review of the compliance history for Otter Creek WWTP indicated that Notice of Violations (NOV) were issued in February 2015, December 2014, and March 2014 for failure to comply with terms and conditions of the KPDES permit requirements for Total Phosphorous. As a result, the facility was referred to the Division of Enforcement for the previous violations in

July 2015. Action taken by the facility resulted in a return to compliance and closure of the Agreed Order in November 2015. In June 2014, an NOV was issued for failure to comply with the KPDES requirements for Whole Effluent Toxicity (WET). An NOV was also issued in March 2013 for failure to comply with the KPDES permit requirements for Total Phosphorous. Otter Creek WWTP received NOV's in August, July, June, May, April, March, and February 2012 for failure to comply with the KPDES permit requirements for Total Phosphorous. The facility was referred to the Division of Enforcement for the violations in 2012 and other violations that occurred in 2011. An Agreed Order was executed between the facility and the state in July 2012. Corrective action performed at the WWTP enabled the facility to return to compliance and the Agreed Order was closed in February 2013.

Silver Creek WWTP is located between the intersection of Caleast Road and Ballard Road and the intersection of Menelaus Road and CSX Railroad. The plant was constructed to a capacity of 1.0 MGD. Its average daily flow from January 1, 2015 to December 31, 2016 was .337 MGD. Silver Creek WWTP discharges its effluent to Otter Creek, a tributary of the Kentucky River, at mile point 29.2. Discharge limits are established through KPDES permit number KY0103357 (Table 3). Facilities consist of screening, facultative lagoon, biological reactor, sedimentation, ultraviolet disinfection, and post aeration.

Table 3
KPDES Permit Limitations
Silver Creek Wastewater Treatment Plant

Parameter	Monthly	Weekly
Carbonaceous Biochemical Oxygen Demand (CBOD ₅)	10 mg/l	15 mg/l
Percent Removal CBOD ₅	85%	NA
Total Suspended Solids (TSS)	30 mg/l	45 mg/l
Percent Removal TSS	85%	
Ammonia-Nitrogen (as NH ₃ N)		
May 1 - October 1	4 mg/l	6 mg/l
November 1 - April 30	10 mg/l	15 mg/l
	130 colonies/100 ml	240 colonies/100 ml
Escherichia coli		
Dissolved Oxygen (DO)	7.0 mg/l minimum	
pH (Standard Units)	6.0 minimum, 9.0 maximum	
Total Phosphorous	1.0 mg/l	2.0 mg/l

A review of the compliance history for Silver Creek WWTP indicated that two Notice of Violations (NOV) were issued in August and March of 2016 for failure to comply with terms and conditions of the KPDES permit requirements for BOD for the months of April and October 2016, respectively. The facility received a NOV in December 2015 for failure to comply with KPPDES permit requirements for BOD during the month of September 2015. The WWTP received NOV's in June 2014, March 2013, and December 2012 for failure to comply with the KPDES requirements for Whole Effluent Toxicity (WET) during the months of December 2013, June, September, October, November and December of 2012, respectively.

Package Wastewater Treatment Plants:

The planning area contains three privately-owned, permitted wastewater package treatment plants also considered potential sources of pollution to streams. Brocklyn Subdivision WWTP is an extended aeration package plant located in Silver Creek watershed with a capacity of 0.040 MGD. Treatment processes include bar screening, aeration, sedimentation, lagoon, disinfection, and post aeration. Effluent is discharged to an unnamed tributary to Taylor Fork, KPDES permit number KY0081299. Executive Park WWTP, also located in Silver Creek Watershed, is an extended aeration package plant with a capacity of 0.030 MGD. Its current treatment train includes screening, chlorine disinfection, activated sludge, and comminutors. Effluent is discharged to Hayes Fork at mile point 2.2, KPDES permit number KY0056561. Blue Grass Army Depot package plant, located in Silver Creek watershed, utilizes settling and trickling filter treatment. The package plant has a capacity of 0.0375 MGD and discharged effluent into an unnamed tributary to Hays Fork, KPDES permit number KY0020737. No package wastewater plant will be eliminated by this project.

Septic and On-site Systems:

Over 1,400 on-site septic tanks are located within the planning area of Richmond Utilities. Customers with access to gravity sewers will be required to connect onto the sewer system. Richmond Utilities is aware of only a single household in the planning area and will have access.

Collection System:

The City of Richmond owns and operates a municipal wastewater collection system containing collector and lateral sewers, interceptor and trunk sewers, pump stations, and force mains. The collection system appears to have begun as a combined sewer system and connections to the storm sewer were made by residential sanitary sewer laterals. The sewers have since been separated as a 1976 field study observed no obvious cross-connections between sanitary and storm sewers. An analysis of operating data for existing collection systems of Otter Creek and Silver Creek WWTTPs indicates excessive infiltration and inflow; however, neither facility has experienced a by-pass event.

D. Need for Project

The southern portion planning area, served by Silver Creek WWTP, has seen rapid growth due to the construction of a new interchange on I-75. The average operating capacity of Silver Creek WWTP was 0.366 MGD, or 36.6% of its rated design capacity of 1.0 MGD. The facility has received several NOVs for failing to meet regulatory requirements for BOD and Whole Effluent Toxicity. Also, the existing collection system in the area is degrading and prone to excessive infiltration and inflow. The increase in population, retail, and commercial businesses in the planning area, all though positive, is expected to cause the existing treatment facility to exceed the rated capacity. The purpose of this update to the Facilities Plan for the City of Richmond is to allow for improvements and expansion of the current system in a manner that is functional within the constraints and conditions imposed by the surrounding environment.

E. Alternatives Analysis

The Facilities Plan includes recommendations to upgrade the collection system and treatment facilities in the planning area in order to ensure adequate capacity for current and future growth.

Otter Creek Wastewater Treatment Plant Alternatives

All treatment alternatives considered were based on the waste load allocation and design criteria as presented in Table 4; and to meet current requirements/regulations.

Table 4		
Design Criteria for Otter Creek Wastewater Treatment Plant		
Parameter	Design Criteria	
	Influent	Effluent
Average Design Flow	12.0 MGD	--
CBOD5	13,244 lbs/day	20 mg/l
TSS	15,050 lbs/day	30 mg/l
Ammonia-Nitrogen <i>May 1 – Oct 31</i>	1,023 lbs/day	4 mg/l
Ammonia-Nitrogen <i>Nov. 1 – April 30</i>		10 mg/l
Total Phosphorus	--	1 mg/l
Total Nitrogen	--	monitor, mg/l
Total Residual Chlorine	--	0.011 mg/l
Dissolved Oxygen	--	7 mg/l (min.)
Chronic Toxicity	--	1.0 TUc
<i>E. coli</i> Monthly Average	--	130 col./100 ml
<i>E. coli</i> Weekly Maximum	--	240 col./100 ml
Reliability Classification = Grade C		

- *Alternative 1 – Oxidation Ditches*

This alternative would add two additional Enhanced Biological Nutrient Removal (EBNR) systems and two additional clarifiers to increase the rated design capacity of the treatment plant to 12 MGD average daily flow (36 MGD peak daily flow). Nutrients would be removed primarily by the EBNR process with backup metal salt chemical feed systems. The existing chemical feed system is currently designed to withstand the additional flow. The piping needed for this alternative was included in the 2007 construction of the treatment facility. Other improvements associated with this alternative include: One new influent splitter box to divert flows to the EBNR systems; Two new WEMCO influent pumps and controls to convey additional flow to the headworks of the facility; Two new EBNR systems including anaerobic selector basins, anoxic basins, and appurtenances; Two new circular clarifiers and appurtenances; One new clarifier splitter box; and, Yard piping modifications.

- *Alternative 2 – Integrated Fixed-Film Activated Sludge*

The alternative considers an Integrated Fixed-Film Activated Sludge (IFAS) process in order to gain additional capacity without constructing new EBNR basins. Introducing biomass carriers into an existing oxidation ditch is a potential method for enhancing treatment capacity without increasing the current footprint. However, this alternative cannot be easily implemented due to the unique patterns within the oxidation ditch. Concrete flow channels and vertical aerators would have to be removed. New diversion walls would need to be constructed along with aeration grids and blowers. A curtain wall with screens and mixers would also need to be constructed to keep media suspended and from leaving the basin. Other improvements associated with this alternative include: One new influent splitter box to divert flows to the new EBNR systems; Two new WEMCO influent pumps and controls to convey additional flows to the headworks of the existing facility; Three new IFAS reactor modifications to the existing oxidation ditches; Two new circular clarifiers and appurtenances; One new clarifier splitter box; and, Yard piping modifications. Cost estimates for Alternatives 1 and 2 are presented in Table 5.

Table 5 Preliminary Probable Costs for Alternatives 1 and 2 Otter Creek Wastewater Treatment Plant		
Parameter	Alternative 1	Alternative 2
Construction costs	\$8,628,125	\$10,330,375
Operation & Maintenance costs	\$10,392,226	\$10,392,226
Salvage value	\$214,890	\$365,690
Present worth	\$18,805,461	\$20,356,911

- *Alternative 3 – Regionalization*

Upon completing construction of Otter Creek WWTP, two existing facilities in the planning area Dreaming Creek and Tates Creek WWTPs were taken off-line and flows were directed to Otter Creek WWTP. Regionalizing Richmond Utilities sanitary sewer with another community was not practical at this time nor is it economically feasible to do so now. Therefore, this alternative will not be considered.

- *Alternative 4 – No Action*

No action will not provide additional treatment capacity and the current treatment system may become overloaded and unable to treat future flows and loadings from the planning area in the next 10 to 12 years. This may also lead to future exceedances of discharge limits at treatment facilities resulting in enforcement action and requiring corrective action and potential excessive rate increases to customers. Therefore, this alternative will not be considered.

- *Selected Alternative*

Based on an evaluation of cost estimates, and non-monetary impacts including those affecting the environment, as well as construction, operation, reliability of technologies, and

public perception; the selected alternative for Otter Creek WWTP is the installation of additional oxidation ditches. This will occur in Phase II of the Facilities Plan.

Silver Creek Wastewater Treatment Plant Alternatives

- *Alternative 1 – Aerated Facultative Lagoon*

Silver Creek WWTP utilizes aerated facultative lagoon technology, exposing wastewater to three different types of biological treatment including aerobic, facultative, and anaerobic zones. The total treatment capacity of the facility is 1.0 MGD, consisting of two lined 7.5 million gallon basins with a hydraulic detention time of 15 days. This alternative would require construction of two additional basins with approximately 45 million gallons of treatment capacity with a 15 day hydraulic detention time resulting in an additional 3.0 MGD. Other improvements associated with this project include: Two new influent pumps rated at 2.0 MGD each to convey sewage to the new headworks; One new headworks with one-quarter inch screens and compactors; Two new aerated facultative lagoons; One new bio-tower; Two new circular clarifiers and appurtenances; One new clarifier splitter box; Improvements to the metal salt feed system; and, Yard piping modification. Cost estimates for this alternative are presented in Table 7.

- *Alternative 2 – Ovivo Oxidation Ditches*

This alternative would add two EBNR systems and two additional clarifiers to increase the design capacity of the facility to 4.0 MGD average daily flow (13.0 MGD peak daily flow). Nutrients will be removed via the EBNR process with backup metal salt chemical feed systems. The existing chemical feed system would be updated to compensate for additional flows. The Ovivo type oxidation ditch system uses anoxic zones and additional treatment units to meet reliability requirements. Additional improvements associated with this alternative include: Two new influent pumps rated at 2.0 MGD each to convey sewage to the new headworks facility; One new headworks with one-quarter inch screens and compactors; Two new Ovivo oxidation ditch basins; One new clarifier splitter box; Two new circular clarifiers and appurtenances; Improvements to the metal salts feed system; and, Yard piping modifications. Cost estimates for this alternative are presented in Table 7.

- *Alternative 3 – Orbal Oxidation Ditches*

This alternative would add one EBNR system and two additional clarifiers to increase the design capacity of the facility to 4.0 MGD average daily flow (13.0 MGD peak design flow). The EBNR process would be the primary nutrient removal mechanism with metal slat chemical feed systems serving as a backup. Existing feed systems would be upgraded to compensate for additional flows. The Orbal oxidation ditch system uses concentric rings in a single basin, eliminating the need for anoxic zones and other treatment units. The Orbal system has the capability to divert influent flow to inner rings of the oxidation ditch to prevent washout during storm events. Additional improvements associated with this alternative include: Two new influent pumps rated at 2.0 MGD each to convey sewage to new headworks at the facility; One new headworks with one-quarter inch screens and compactors; One new Orbal oxidation ditch basin; One new clarifier splitter box; Two new circular clarifiers and appurtenances;

Improvements to the metal salt chemical feed systems; and, Yard piping modifications. Cost estimates for this alternative are presented in Table 7.

- *Alternative 4 – Regionalization*

The City of Richmond began regionalizing treatment facilities in the planning area upon completion of Otter Creek WWTP. Two existing treatment plants, Dreaming Creek and Tates Creek, were taken off-line and flows diverted to the facility at Otter Creek. Silver Creek WWTP was built in the summer of 1999 to treat waste generated in the southern portion of the planning area, primarily along Duncannon Road and the new industrial park. This alternative will continue to pursue regionalization in the planning area by eliminating the KPDES discharge at Silver Creek and conveys flows to Otter Creek WWTP through the existing conveyance system. A new pump and a 16-inch force main will be built at Silver Creek WWTP that will discharge into a diversion manhole located at the Pavilion #1 Pump Station on Duncannon Road. Implementation of Phase I of this alternative will divert as much as 2.25 MGD to Otter Creek WWTP with Phase II diverting an additional 2.25 MGD. Cost estimates for this alternative are presented in Table 6.

Table 6
Preliminary Probable Costs for Alternatives 1, 2, 3, and 4
Silver Creek Wastewater Treatment Plant

Parameter	Alternative 1	Alternative 2	Alternative 3	Alternative 4
Construction costs	\$12,872,750	\$12,520,750	\$10,888,625	\$10,524,600
Operation & Maintenance costs	\$8,078,690	\$9,389,852	\$7,964,675	\$3,848,524
Salvage value	\$343,070	\$497,640	\$542,880	\$614,027
Present worth	\$20,608,370	\$21,412,962	\$18,310,420	\$13,759,097

- *Alternative 5 – No Action*

This alternative will prohibit increasing treatment capacity in the planning area and may cause future overloading and compliance issues in the next 10 to 12 years. Discharges from facilities may exceed limits set by the KPDES permits. Such violations would result in enforcement action against Richmond Utilities, require corrective action and spending of funds not properly prepared planned for, and may results in excessive rate increases to customers. Therefore, this alternative will no longer be considered.

- *Selected Alternative*

The selected alternative for Silver Creek WWTP is regionalization based on an evaluation of cost estimates and non-monetary impacts including operability, reliability, environmental impacts, constructability, and public perception.

Wastewater Collector and Trunk Sewer Systems

- *Collector Sewers*

Details on collection sewers for future development are beyond the scope of this Facilities Plan. The City of Richmond realizes the potential exists for development to occur in areas prior to construction of trunk sewers necessitating construction of facilities with limited capacities to pump back into the system on an interim basis. Should this occur, those facilities would be either incorporated into the plan or abandoned once trunk facilities are constructed.

- *Outfall Sewers*

Construction of outfall sewers will occur in three phases (0-2, 3-10, and 11-20 year periods) as presented in Table 7. Construction and project estimates for each phase are based on 2015 costs.

Table 7			
Water Treatment Plant and Sewer System Improvements			
Preliminary Probable Costs			
Description	0-2 Years	3-10 Years	11-20 Years
<i>Wastewater Treatment Plants</i>			
Otter Creek		\$8,628,125	
Silver Creek - Phase 1	\$7,008,500		
Silver Creek - Phase 2		\$3,516,100	
Sub-total Water Treatment Plants	\$7,008,500	\$12,144,225	
<i>Otter Creek Sewers</i>			
Lancaster Road (TC-15) Service Area	\$825,000		
Motel 6 Pump Station Rehabilitation	\$206,000		
Wilderness Trail & Lost Fork Outfall Sewers		\$2,346,000	
South Robert R. Martin Bypass Pump Station		\$295,600	
Taylor Fork Relief Sewer		\$790,600	
Lower West Fork Outfall Sewer System			\$3,026,400
Sub-total Otter Creek Sewers	\$1,031,000	\$3,432,200	\$3,026,400
<i>Silver Creek Sewers</i>			
Silver Creek Outfall Sewers	\$1,134,400		
Duncannon Road Area Outfall Sewers		\$1,813,000	
North Duncannon Road Area		\$1,678,900	
Parrish Road Area		\$395,400	
Hays Fork Outfall Sewer			\$2,990,700
Old Town Branch Pump Station & Force main			\$976,000
Sub-total Silver Creek Sewers	\$1,134,400	\$3,887,300	\$3,966,700
<i>Sanitary Sewer Rehabilitation</i>	\$300,000	\$300,000	\$300,000
Totals	\$9,473,900	\$19,763,725	\$7,293,100

F. Environmental Consequences, Mitigative Measures

Historic Properties and Archeological Sites

The Kentucky Heritage Council (KHC), in a letter dated November 16, 2016, stated that “although small portions of the project area have been archeologically surveyed previously, the majority of the project area has not been surveyed”. KHC expressed that “prior nearby surveys have documented numerous archeological sites in similar settings, including sites which have been determined to be eligible for listing in the National Register of Historic Places (NRHP)”. KHC recommended that “all project areas which have not been surveyed, to date, be surveyed by a qualified professional archeologist” and that a report of the investigations is sent to their office for review. In order determination if above-ground properties eligible for listing in the NRHP will be affected by the project, “the applicant must submit photographs of all structures 50 years old or older that are within or visible from the project area. Each photograph should be labeled by street address or map coordinates with a brief description of potential impacts or proposed treatment, and should be accompanied by a project map showing their location”. Upon review of this information, KHC will advise if further consultation is required. In a letter dated June 7, 2017 Richmond Utilities committed to comply with all Federal and state requirements for construction activities within undisturbed areas.

Threatened and Endangered Species

The United States Department of the Interior, Fish and Wildlife Service (USFWS), in their October 25, 2016 correspondence, provided a list of threatened and endangered species that may occur in Phase 1 of the proposed project area:

- Running Buffalo Clover (*Trifolium stoloniferum*)
- Short’s Bladderpod (*Physaria globosa*)
- Gray bat (*Myotis grisescens*)
- Indiana bat (*Myotis sodalis*)
- Northern Long-eared bat (*Myotis septentrionalis*)
- Virginia Big-Eared bat (*Corynorhinus (=plecotus) townsendii virginianus*)

This species list fulfills the requirements of the USFWS under section 7(c) of the Endangered Species Act (ESA) of 1973, as amended (16 U.S.C. 1531 et seq.) to provide information as to whether any proposed or listed species may be present in the area of the proposed action. The official species list in not a concurrence letter; additional coordination with the service may be required”.

The Service stated that “a Biological Assessment is required for construction projects (or other undertakings having similar physical impacts) that are major Federal actions significantly affecting the quality of the human environment as defined in the National Environmental Policy Act (42 U.S.C. 4332(2) (c)). For projects other than major construction activities, the Service suggests that a biological evaluation similar to a Biological Assessment be prepared to determine whether the project may affect listed or proposed species and/or designated or proposed critical habitat. Recommended contents of a Biological Assessment are described at 50 CFR 402.12. We

recommend that Biological Assessments and biological evaluations be submitted to the Kentucky Field Office following the guidance at:"

<http://www.fws.gov/frankfort/PreDevelopment.html>.

"If a Federal agency determines, based on the Biological Assessment or biological evaluation, that listed species and/or designated critical habitat may be affected by the proposed project, the agency is required to consult with the Service pursuant to 50 CFR 402. In addition, the Service recommends that candidate species, proposed species and proposed critical habitat be addressed within the consultation. More information on the regulations and procedures for section 7 consultation, including the role of permit or license applicants, can be found in the "Endangered Species Consultation Handbook" at:"

<http://www.fws.gov/endangered/esa-library/pdf/TOC-GLOS.PDF>.

The Kentucky Department of Fish and Wildlife Resources (KDFWR), in a letter dated October 13, 2016, responded, "due to the location and nature of the project, the KDFWR does not anticipate impacts to listed species or any associated critical habitat. To minimize impacts to the aquatic environment, the KDFWR recommends erosion control measures be developed and implemented prior to construction to reduce siltation into water ways and/or karst features located within the project area".

In a letter dated June 7, 2017 Richmond Utilities committed to comply with all Federal and state requirements for construction activities within undisturbed areas.

Wetlands and Streams

In a correspondence letter, dated June 14, 2017, the United States Department of the Army, Corps of Engineers (USACE) stated the project "...is considered a discharge of backfill or bedding material for utility lines. The project is authorized under the provisions of 33 CFR 330 Nationwide Permit (NWP) No. 12, Utility Line Activities, as published in the Federal Register January 6, 2017. Under the provisions of this authorization you must comply with the enclosed Terms and General Conditions for Nationwide Permit No. 12". Richmond Utilities must also comply with "Water Quality Certification (WQC) Conditions for Nationwide Permit No. 12, dated March 19, 2017, issued by the Kentucky Division of Water (KDOW). Once you obtain your certification, or if no application is required, you may proceed with the project without further contact or verification from us." In a letter dated June 12, 2017 Richmond Utilities committed to comply with all requirements identified by the USACE for construction activities within undisturbed areas.

Prime Farmland or Farmland of Statewide Importance

The USDA Natural Resources Conservation Service (NRCS), in a letter dated November 16, 2016, stated that a soils report with maps was compiled by the agency. "This report gives the farmland classification and hydraulic soils rating for the soils of Madison County." If more site specific information is needed, shapefiles will be required "to accurately locate each sewer line, maps showing the corridor width involved, and where the line is utilizing existing easements, either by utility or right-of-way, and where it will fall on a new easement". In a letter dated July

5, 2017 Richmond Utilities committed to comply with all requirements for construction activities within undisturbed areas.

Impacts on Air Quality

Kentucky Division for Air Quality Regulation 401 KAR 63:010 – Fugitive Emissions states that no person shall cause, suffer, or allow any material to be handled, processed, transported, or stored without taking reasonable precaution to prevent particulate matter from becoming airborne. Additional requirements include the covering of open-bodied trucks, operating outside the work area transporting materials likely to become airborne, and that no one shall allow earth or other material being transported by truck or earth moving equipment to be deposited onto a paved street or roadway. Please note the Fugitive Emissions Fact Sheet located at <http://air.ky.gov/Pages/ComplianceandInspections.aspx>.

Kentucky Division of Air Quality Regulation 401 KAR 63:005 states that open burning is prohibited. Open burning is defined as the burning of any matter in such a manner that the products of combustion resulting from the burning are emitted directly into the outdoor atmosphere without passing through a stack or chimney. However, open burning may be utilized for the expressed purposes listed in the Open Burning Brochure located at <http://air.ky.gov/Pages/OpenBurning.aspx>. The Open Burning hotline is 1-888-287-5629.

The Kentucky Division of Air Quality also recommends the following strategies for protecting the state's air quality:

- Utilize alternatively fueled equipment.
- Utilize other emission controls as applicable to the equipment used.
- Reduce idling time on equipment.
- Investigation into compliance with applicable local government regulations.

Miscellaneous Impacts

The environmental impact of constructing the proposed facilities includes only those temporary impacts of noise, dust, and service and traffic disruption in the construction area. The proposed project is expected to result in improvements to the surface water and groundwater quality in the planning area over the next 20 years.

G. Public Participation and User Rates

On Thursday March 2, 2017, a public hearing on the *Richmond Utilities Regional Facilities Plan* was held 10:00 a.m. at the offices of Richmond Utilities, 300 Hallie Irvine Street, Richmond, Kentucky. The meeting presented the findings and recommendations of the *Richmond Utilities Regional Facilities Plan* to stakeholders and customers of the wastewater system. The meeting was advertised through official public notice in the Richmond Register on Friday January 27, 2016. No public comments were received during the public comment period or at the public meeting. The DOW is not aware of any unresolved comments related to the *Richmond Utilities Regional Facilities Plan*.

As of July 1, 2015, the user rate for wastewater utilities inside the City of Richmond is \$43.75 for 4,000 gallons per month. Out of the City, the rate is \$87.49 for 4,000 gallons per month. Richmond Utilities intends to seek funding through Clean Water State Revolving (CWSRF) Fund loans. Phase 1 of the project will require approximately \$9,473,900 worth of improvements. A 20-year SRF loan at an interest rate of 0.25% would require approximately \$485,000 in annual revenue to cover the loan payment. Adding 20% for debt service coverage increases the total annual revenue to \$582,000 needed to cover the loan payment. Operation and maintenance requirements are expected to decrease by \$200,000 due to less staff, chemical, and energy costs, reducing the overall net revenue to \$382,000 required for this alternative. Revenue generated from user rates in 2015 totaled \$9,539,000. Based on this data, a 3.98% increase in user rates will be required bringing the rate for \$4,000 gallons per month to \$45.49 inside the City and \$90.97 out the City.

A 30-year SRF loan at an interest rate of 0.25% would require approximately \$328,000 in annual revenue to cover the loan payment. Adding 20% for debt service coverage increases the total annual revenue to \$393,000 needed to cover the loan payment. Operation and maintenance requirements are expected to decrease by \$200,000 due to less staff, chemical, and energy costs, reducing the overall net revenue to \$382,000 required for this alternative. Revenue generated from user rates in 2015 totaled \$9,539,000. Based on this data, a 2.00% increase in user rates will be required bringing the rate for \$4,000 gallons per month to \$44.63 inside the City and \$89.24 out the City.

H. Sources Consulted

Kentucky Department of Fish & Wildlife Resources
Kentucky Division for Air Quality
Kentucky Division of Water
Kentucky Heritage Council
Kentucky State Clearinghouse
Natural Resources Conservation Service
Richmond Utilities Regional Facilities Plan: Planning Period 2017-2037
U.S. Fish & Wildlife Service
USDA Soil Conservation Service
U.S. Army Corps of Engineer

Figure 1. Richmond Utilities Wastewater Planning Area.

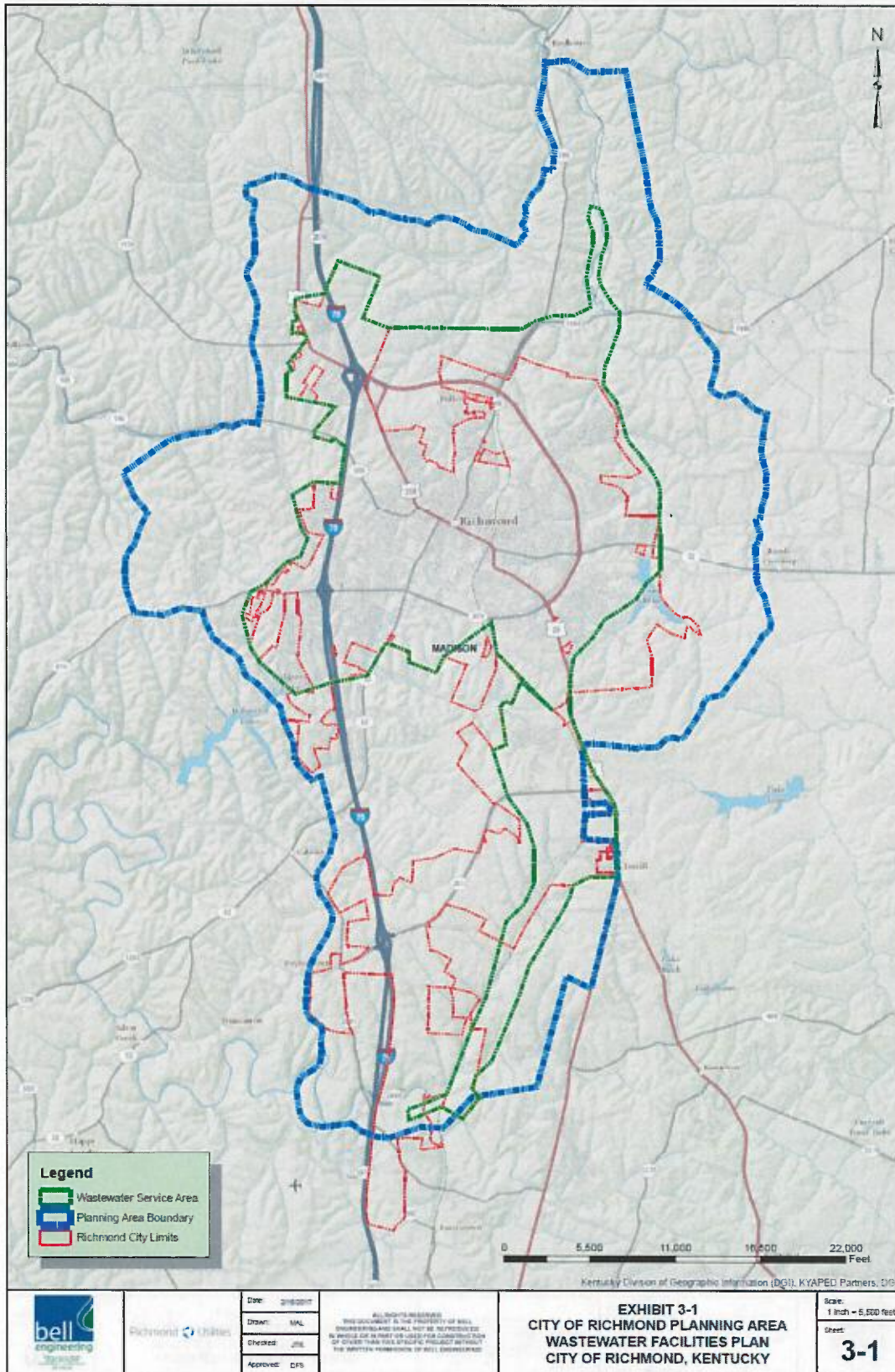


Figure 2. Richmond Utilities Wastewater System Improvements.

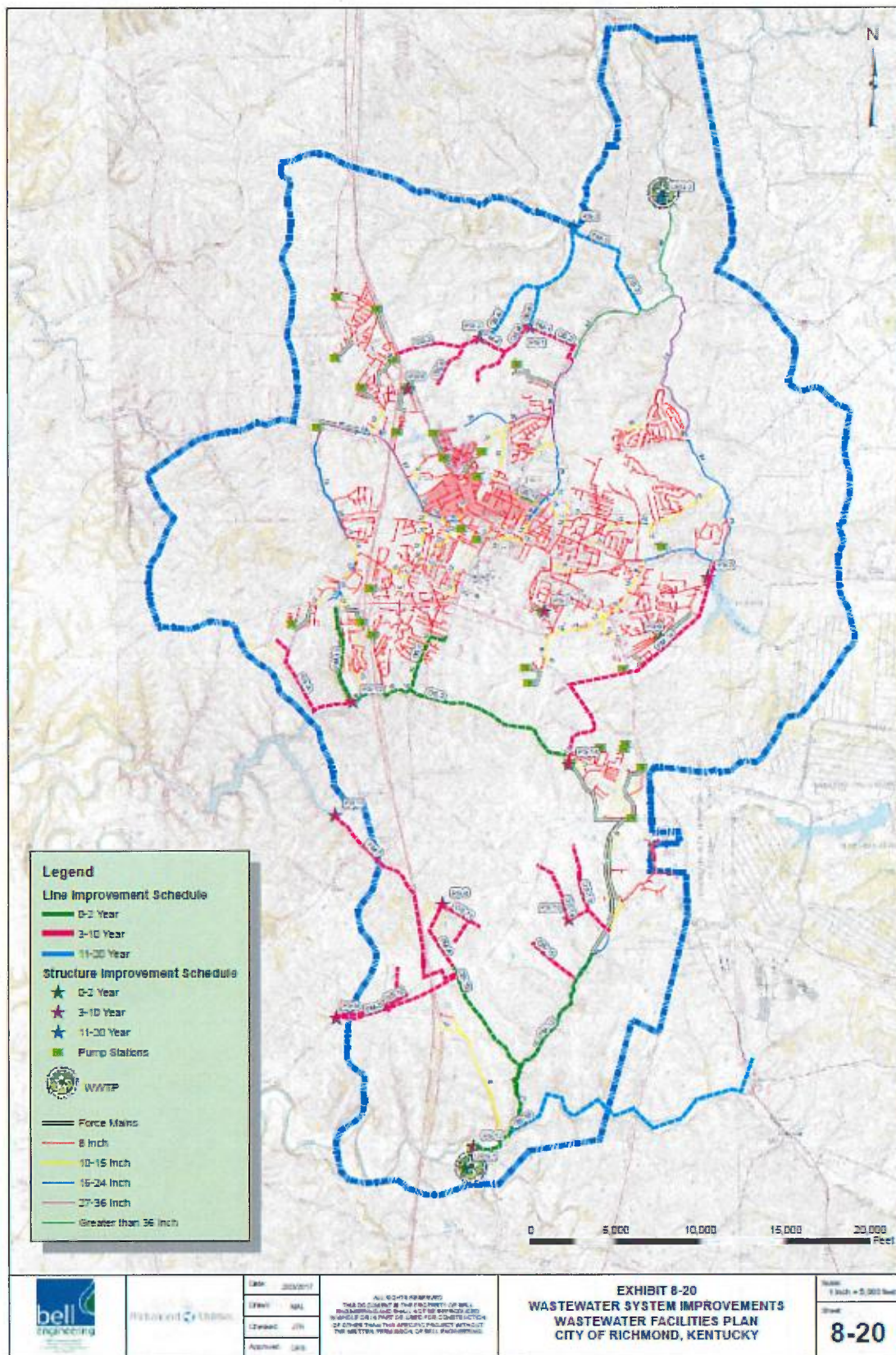
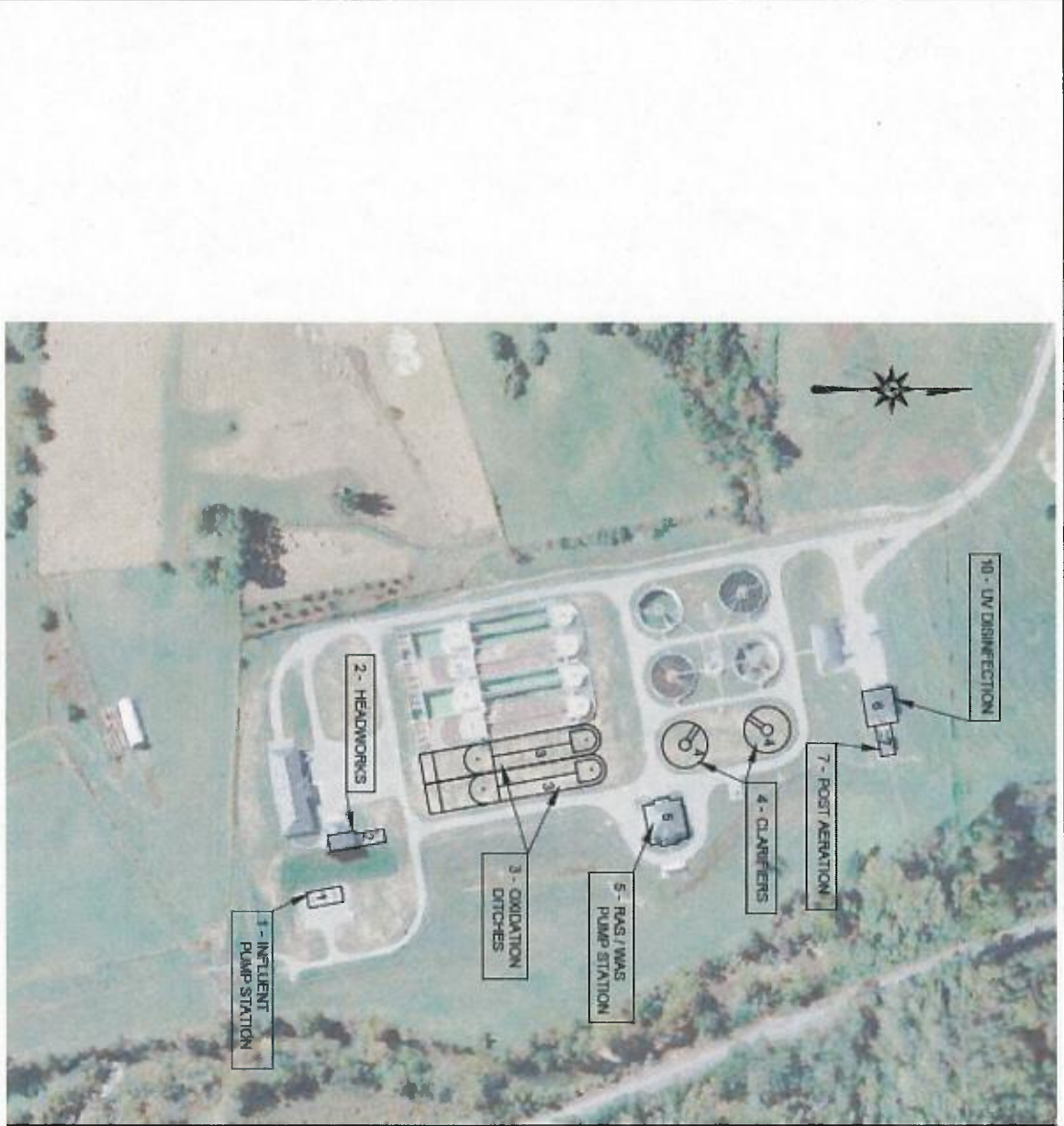


Figure 3. Otter Creek WWTP Selected Alternative.



 <p>200 South Main, Suite 100 Richmond, KY 40476 P: 606.223.1111 F: 606.223.1112 www.bell.com</p>		Date: 4/22/16	<p>ALL RIGHTS RESERVED THIS DOCUMENT IS THE PROPERTY OF BELL ENGINEERING AND SHALL NOT BE REPRODUCED OR TRANSMITTED IN ANY FORM OR BY ANY MEANS, ELECTRONIC OR MECHANICAL, INCLUDING PHOTOCOPYING, RECORDING, OR BY ANY INFORMATION STORAGE AND RETRIEVAL SYSTEM, WITHOUT THE WRITTEN PERMISSION OF BELL ENGINEERING.</p>	<p>OTTER CREEK WWTP ALTERNATIVE #1 WASTEWATER FACILITIES PLAN CITY OF RICHMOND, KENTUCKY</p>	Scale: 1" = 200'
		Drawn: LGL			<p>EXHIBIT 8-3</p>
		Checked: DFS			
		Approved: DFS			

