Derek R. Guthrie
Water Quality Treatment Center
Regional Facilities Plan
2017

October 2017

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SECTION 1: REGIONAL FACILITIES PLAN SUMMARY

1.1 INTRODUCTION AND BACKGROUND

A Regional Facilities Plan (RFP) is a comprehensive plan for the management of wastewater collection and treatment facilities. Planning is intended to define the most appropriate "local" solution to providing wastewater service (collection and treatment) for a defined planning area over a defined period of time. The goal of the RFP is to ultimately protect the environment and human health by providing reliable wastewater collection and treatment for areas of greatest need. The RFP is ultimately reviewed and approved by the Kentucky Division of Water (KDOW). KDOW requires a checklist be submitted with the completed RFP, which is attached in Section 12 for reference. Review and approval considers environmental and state clearinghouse reviews in addition to technical review.

Louisville is an incorporated city located in Jefferson County, Kentucky. Louisville and Jefferson County Metropolitan Sewer District (MSD) identified an in-house team, with assistance from CH2M Engineers, Inc. to evaluate the Derek R. Guthrie (DRG) Water Quality Treatment Center (WQTC) wastewater conveyance and treatment needs for a 20-year planning period ending in 2036.

1.2 PURPOSE OF THE PLAN

The DRG Planning Area is shown in Figure 1-1. MSD is required under an Amended Consent Decree (ACD) with the United States Environmental Protection Agency (USEPA), the Kentucky Department for Environmental Protection (KDEP) and the United States Department of Justice (DOJ) to reduce combined sewer overflows (CSOs) and eliminate sanitary sewer overflows (SSOs) throughout MSD's system.

In 2008 MSD completed and USEPA/KDEP approved the Interim Sanitary Sewer Discharge Plan. The ISSDP included a project to increase the wet weather capacity at the Derek R. Guthrie WQTC to 200 MGD in order to convey and provide full secondary treatment for additional sanitary sewer system (SSS) wet weather flows resulting from implementing overflow abatement projects. In addition the ISSDP defined an approach to reduce CSOs by diverting flow away from part of the sanitary sewer service area tributary to the Morris Forman (MF) WQTC and routing the flow to the new wet weather treatment facilities at the DRG WQTC as flows dictate and capacity is available at the DRG WQTC. The Northern Ditch

Figure: 1-1

DEREK R. GUTHRIE FACILITES PLAN UPDATE
LOUISVILLE AND JEFFERSON COUNTY
METROPOLITAN SEWER DISTRICT

PLANNING AREA LOCATION

MORRIS FORMAN SERVICE AREA

JEFFERSONTOWN SERVICE AREA

CEDAR CREEK SERVICE AREA

DEREK R. GUTHRIE

CEDAR CREEK

BULLITT HILLS

Bullitt County

- MSD Regional Treatment Plant
- MSD Treatment Plant
- Private Treatment Plant
- Streams
- Expressway
- Major Roads
- Jefferson County Boundary
- Pond Creek Watershed
- Mill Creek Watershed
- Currently Not Serviced
- Planning Area Boundary

N
W E
S

0 0.75 1.5 Miles

1 inch equals 1.5 miles

Map Prepared by MSD GIS Services and Records

Map Created: 7-APR-2017

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Diversion Structure allows wet weather flow to be diverted from the Morris Forman sewer service area to the Derek R. Guthrie sewer service area. This wet weather diversion allows for an overall reduction in CSO volume and an improvement overall water quality.

The ISSDP projects were later incorporated into the Integrated Overflow Abatement Plan (IOAP) which was submitted to EPA/KDEP in 2008 and approved and incorporated into MSD's Amended Consent Decree by reference in 2009. All the projects defined in the ISSDP have been constructed and put into operation in accordance with the approved schedule.

The main purpose of this RFP is to assemble a long-range plan for continuing to provide effective and efficient sanitary sewer service to MSD customers in this planning area. The RFP will also be used to identify the improvements required, and their recommended priority and timing, to meet projected customers' needs in the next 20 years. MSD commissioned this RFP to evaluate the existing DRG WQTC wastewater collection system and treatment facilities, establish any additional sewer service needs, evaluate alternatives, and develop design and construction schedules and budgets for the recommended plan.

1.3 RECOMMENDED ALTERNATIVE

The recommended alternative is a re-rating of the DRG WQTC capacity from the current 30 million gallons per day (mgd) Average Daily Flow (ADF) to 60 mgd. The new capacity is due to the increase in treatment processes constructed to treat wet weather flow diversions from some of the sanitary sewers normally tributary to the MF WQTC as identified in the Integrated Overflow Abatement Plan (IOAP). The wet weather diversions of sanitary sewage diluted by residual rainfall-derived infiltration and inflow increase the ADF significantly when calculated over the entire year. To account for this increased overall loading additional modifications shown in Table 1-1 have been recommended. These modifications include increased capacity for Return Activated Sludge (RAS) pumps and piping, replaced air piping for the aeration basins and mechanical rehabilitation of three existing clarifiers. The modifications to the plant and increases in treatment capacity are described in detail in Sections 6 and 8 of this document.

Table 1-1 Recommended WQTC Projects

WQTC Projects	Status
Northern Ditch Diversion Project	Completed October 2010
DRG Wet Weather Capacity Increase?	Operational November 2012
Mechanical Rehabilitation of Existing Clarifiers	Completed May 2017
Return Activated Sludge Pump and Piping Upgrades	Will be completed October 2018
Air Piping Replacement for Aeration Basins	Planning Phases

The conclusions presented in this RFP will be included in support of an application to modify the KPDES permit for the plant, increasing the rated capacity of the DRG WQTC as described herein.

1.4 COST OF PROPOSED PLAN

The projected cost of the work needed to meet the requirements for re-rating the DRG WQTC to 60 mgd ADF is $2 million. The projected cost of the work described in the Collection System alternatives in Table 8-2 is $29,611,000. The projected cost of the IOAP projects in the DRG WQTC Planning area during the period covered by this RFP is $9,917,000. Potential assessment projects are estimated at $16,275,000.

1.5 PLANNING AGENCY COMMITMENTS TO IMPLEMENT THE PLAN

MSD has the authority to prepare and implement the recommended projects since it addresses the needs within the existing DRG Planning Area. All recommended projects will be reviewed and approved by KDOW before construction permits can be issued.

1.6 SCHEDULE OF IMPLEMENTATION FOR RECOMMENDED PROJECTS

The plant improvements required in addition to the work completed under the IOAP wet weather program are scheduled to be completed within 12 months of approval of this facility plan.

Tables 8.2, 8.3 and 8.4 list the general timeframe for the start of the proposed projects.

SECTION 2: STATEMENT OF PURPOSE AND NEED

2.1 INTRODUCTION

An RFP is a comprehensive plan for the management of wastewater collection and treatment facilities. The intent of an RFP is to define the most appropriate "local" solution to providing wastewater collection and treatment for a specific planning area over a defined period of time. Typically the period of time is 20 years; however other periods of time can be used.

An RFP may be required for several reasons including:

1. A specific request of KDOW
2. By regulation (401 KAR 5:006, Section 2)
3. As part of an enforcement action (Agreed Order)

A KDOW request could be triggered by a treatment facility being over 90 percent of its design capacity or because of a KDOW sponsored watershed initiative. Regulation 401 KAR 5:006, Section 2 requires an RFP or update to an RFP for any of the following reasons:

- A new regional planning plant is proposed.
- The equivalent population served by an existing wastewater collection system increases by 30 percent or more from the previous Facilities Plan.
- The average daily flow design capacity at an existing treatment plant increases by over 30 percent.

2.2 PURPOSE AND SCOPE

The Derek R. Guthrie WQTC RFP 2016 is a planning step for the expansion of the wastewater collection and treatment services in the southwestern area of Jefferson County. The main purpose of the RFP is to provide MSD with a near-term plan for providing effective and efficient sanitary sewer service to its customers. Another purpose is to identify the improvements required and their recommended priority and timing to meet projected customers' needs for the next 20 years.

Through this planning effort, MSD evaluated the existing wastewater collection system and treatment facilities, established sewer service needs, evaluated alternatives and developed design and construction schedules and budgets. MSD currently serves the planning area by operation of Derek R Guthrie regional WQTC.

This report describes the condition and capacity of existing conveyance and wastewater

treatment facilities in the planning area. A specific plan for conveyance and wastewater treatment facilities improvements is developed based on current and future system needs. Alternatives for conveyance of growth areas are identified and evaluated. The recommended alternatives for the identified needs are prioritized and supported by an evaluation of monetary costs and nonmonetary considerations.

2.3 REGULATORY CONSIDERATIONS

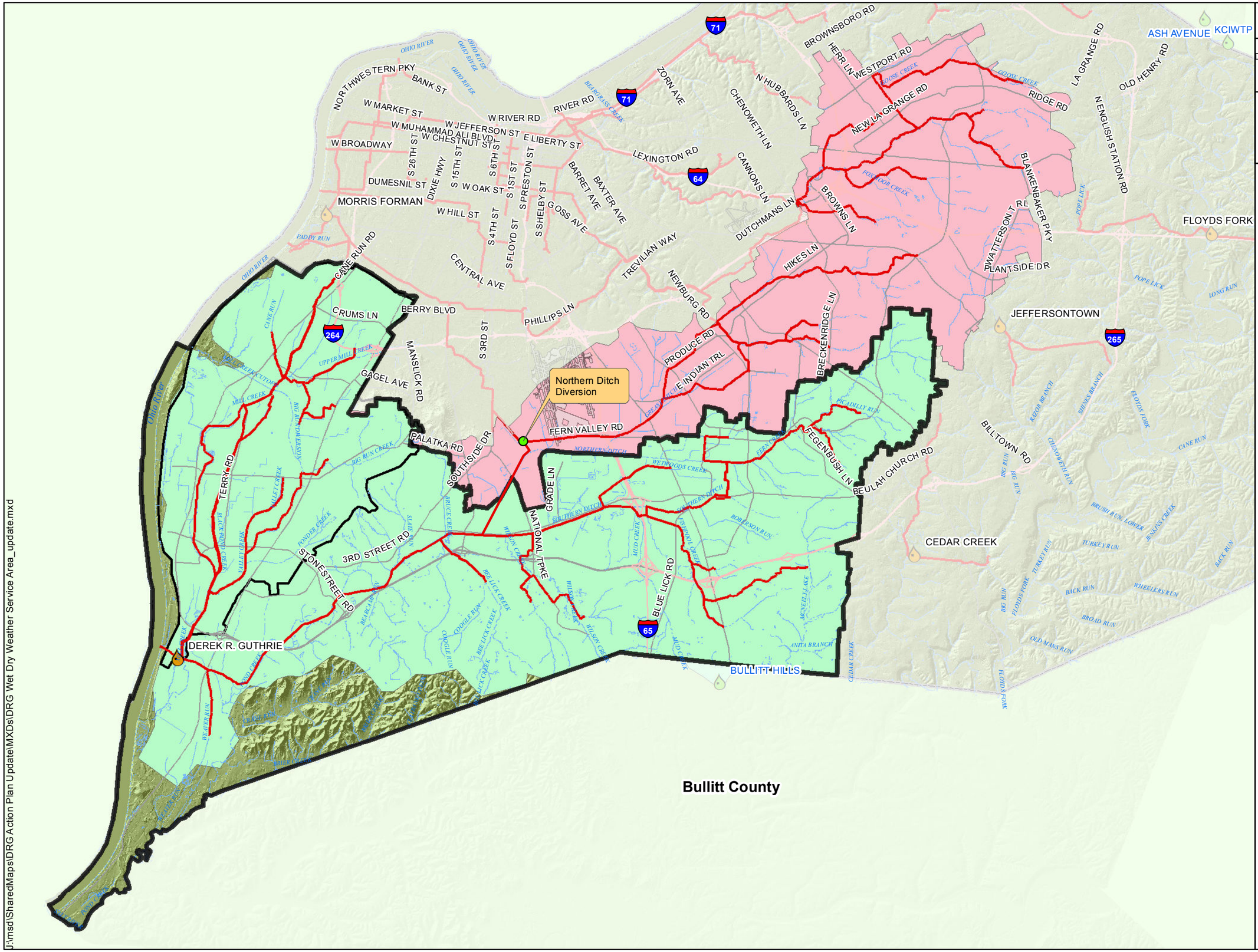
Louisville and Jefferson County Metropolitan Sewer District (MSD) has committed to take necessary measures for controlling sewer overflows and other unauthorized discharges under a federal Consent Decree entered into Federal Court on August 12, 2005. The Consent Decree is between MSD, the US Department of Justice, the U.S. Environmental Protection Agency (EPA) and the Kentucky Department for Environmental Protection (KDEP). The Consent Decree was amended in 2009. In accordance with the requirements of the Amended Consent Decree (ACD), MSD prepared a comprehensive plan to reduce and mitigate the effects of wet weather combined sewer overflows (CSOs), and to eliminate sanitary sewer overflows (SSOs) and other unauthorized discharges. This comprehensive plan, known as the Integrated Overflow Abatement Plan (IOAP) integrates these system improvements into one coordinated response. In an early action activity MSD prepared the Interim Sanitary Sewer Discharge Plan (ISSDP). In the ISSDP MSD specified projects that will significantly reduce unauthorized discharges in four high-priority areas of the sanitary sewer collection system: Beechwood Village, the Hikes Point area, the Highgate Springs Pump Station and the Southeastern Diversion Structure. Implementation of these identified projects will cause significant, additional wet weather flow to be conveyed to the DRG WQTC. At the time the ISSDP was prepared the rated capacity of the DRG WQTC was 30 MGD, with a peak wet weather treatment capacity of 100 MGD. MSD created three major projects for designing and building an expanded wet weather treatment facility because the existing WQTC does not have the necessary treatment capacity for accepting the projected peaks.

The IOAP also recommended diversion to the DRG WQTC a portion of the sanitary sewer flow normally tributary to the combined sewer system of the MF WQTC. Figure 2-1 shows the dry weather service area and the wet weather diversion area. This would reduce CSOs by removing some on the sanitary sewage from the combined sewer system. As a result of the IOAP approach new infrastructure was constructed so that wet weather flow can now be diverted upstream of the Southeast Diversion into the Northern Ditch Interceptor. When this interceptor approaches the Northern Ditch Pump Station all or some of the flow in the Northern Ditch Interceptor can be diverted out of the MF WQTC service area and into the Pond Creek

Figure: 2-1

DEREK R. GUTHRIE FACILITES PLAN UPDATE
LOUISVILLE AND JEFFERSON COUNTY
METROPOLITAN SEWER DISTRICT

DRG WQTC
DRY & WET WEATHER
SEWER SERVICE AREA



- MSD Regional Treatment Plant
- MSD Treatment Plant
- Private Treatment Plant
- Streams
- Expressway
- Major Roads
- Jefferson County Boundary
- Planning Area Boundary
- MajorCollectionSystem
- Dry Weather Service Area
- Wet Weather Service Area
- Currently Not Serviced

N
W E
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0 1 2 Miles

1 inch equals 2 miles

msd
Safe, clean waterways

LOJIC
Louisville/Jefferson County Information Consortium

Map Prepared by MSD GIS Services and Records

Map Created: 7-APR-2017

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Interceptor which then flows to the DRG WQTC. Note that this diversion is closely controlled to ensure that diversion only occur when downstream capacity is available.

This facility is now capable of providing full secondary treatment for 200 MGD of wet weather flow. The expansion of treatment capacity also allows for more treatment of dry weather flow from the normal DRG service area. The diversion of wet weather flow also contributes to a significant increase in the annual average flow treated by the plant, separate from any growth in customers in the dry weather service area. A request to rerate the DRG WQTC from an average daily flow of 30 MGD to 60 MGD is outlined in this RFP. This change in capacity will accommodate the projected increase in service from both residential and commercial growth for the next twenty years, and also account for the increase in overall flow treated due to the wet weather diversions.

The expansion of the DRG WQTC to provide wet weather treatment capacity is described with loadings, process changes, and design data in Sections 6 and 8.

SECTION 3: PHYSICAL CHARACTERISTICS

The DRG WQTC Planning Area, according to the Kentucky Atlas and Gazetteer, is located in the Outer Bluegrass physiographic region. The Outer Bluegrass physiographic region is underlain by limestone and bordered by the Ohio River in the north and by the Knobs in the south, west, and east. The Bluegrass physiographic region has been used extensively for pastureland.

3.1 PLANNING AREA BOUNDARY

The DRG WQTC planning area is in the southwestern sector of the MSD service area. The area is bounded on the west by the Ohio River, on the north by the MF WQTC service area, on the east by the Cedar Creek WQTC service area and on the south by Bullitt County. See Figure 1-1.

The boundary of the DRG WQTC and Morris Forman (MF) WQTC service area reflects a division of areas served by separate sewers being tributary to the DRG WQTC and separate sewer areas tributary to the MF WQTC. As a result of the IOAP approach to CSO control the boundaries of the MF and DRG service areas overlap during certain wet weather events. A full description of the wet weather operation strategy is in Section 6 of this report. Figure 2-1 shows the dry weather service area and the wet weather diversion area. Figure 3-1 depicts existing wastewater infrastructure in the dry weather planning area. The point of connection occurs at the diversion of flow from the Northern Ditch Pump Station to the Pond Creek Interceptor. MSD controls when diversions occur based on flow conditions and capacity at DRG WQTC. MSD has the flexibility to operate using real time control system or in manual mode. For the purposes of this RFP, the original DRG planning area (dry weather service area) will be used for the evaluation of development and growth and the need for additional conveyance and treatment capacity under normal dry weather conditions. The flow from the wet weather diversion area is independent of growth and development in the area, since the extent of flow diversions is a function of flow conditions and available downstream capacity.

3.2 DRG WQTC PLANNING AREA

As previously noted, MSD has the legal authority and responsibility to provide wastewater collection and treatment services within Jefferson County. The DRG WQTC service area is divided into two areas that coincide with the watersheds of Pond Creek and Mill Creek. The Pond Creek service area and the Mill Creek service area provide flow to the DRG WQTC via

Figure: 3-1

DEREK R. GUTHRIE FACILITES PLAN UPDATE
LOUISVILLE AND JEFFERSON COUNTY
METROPOLITAN SEWER DISTRICT

EXISTING WASTEWATER INFRASTRUCTURE AND SERVICE AREA

- MSD Regional Treatment Plant
- MSD Treatment Plant
- Private Treatment Plant
- Streams
- Expressway
- Major Roads
- Jefferson County Boundary
- Pond Creek Watershed
- Mill Creek Watershed
- Currently Not Serviced
- Planning Area Boundary

Sanitary Pump Stations

- MSD
- Private
- P - Operated by MSD

Sewers

- Interceptor
- Sewers

N W E S

0 0.75 1.5 Miles

1 inch equals 1.5 miles

DEREK R. GUTHRIE

Bullitt County

ID Number	Unit ID	Pump Station Name
151	MSD0044-PS	JACKS LANE
153	MSD0043-PS	PIONEER
160	MSD0047-PS	FERN LEA
162	MSD0049-PS	ROSA TERRACE
163	MSD0048-PS	CITY PARK
164	MSD0142-PS	SIX MILE LANE
170	MSD1200-PS	PIROGUE COURT
174	MSD0050-PS	GARRS LN
175	MSD1201-PS	MODES TO ROAD
176	MSD1202-PS	SHANNON RUN
178	MSD1203-PS	KIRBY LANE
179	MSD0052-PS	MILL CREEK
182	33883-PS	CAN RUN RD
183	MSD0053-PS	SANDERS LANE
195	MSD0054-PS	EAST ROCKFORD LANE
200	81642-PS	CHOSEN CHILDRENS HOME
203	MSD0137-LS	PICCADILLY
204	MSD1047-LS	PARKWOOD
210	MSD0160-PS	BRANDYWYNE CT
215	MSD0099-PS	POPLAR LEVEL
218	MSD1048-PS	EDSEL
223	MSD1003-PS	INDUSTRIAL
225	MSD0154-PS	BROADFERN DRIVE
228	MSD1010-PS	LEA ANN WAY
241	63573-PS	FEGENBUSH

ID Number	Unit ID	Pump Station Name
242	MSD0143-PS	PARK RIDGE WOODS
245	MSD0180-PS	GOVERNMENT CENTER
246	88377-LS	ALL TUNE & LUBE
254	98652-PS	MIDLAND
257	82257-PS	OUTER LOOP
258	35686-LS	ROBERTA PARK MHP
262	MSD0140-PS	TREE LINE
268	MSD1051-PS	ADMIRAL
269	MSD0258A-LS	SILVER HEIGHTS WQTC INFL PS
272	MSD0101-PS	LANTANA DRIVE #1
276	92658-PS	KEYS FERRY RD
277	MSD1008-PS	FRANCELL
278	MSD0120-PS	SUNLIGHT
279	55347-PS	CHATAMWOOD DR
280	MSD0133-PS	CAVAN AVE
281	MSD0228A-PS	MCNEELY LAKE WQTC INFLUENT PS
282	MSD1031-PS	BROOKBEND
283	MSD1019-PS	LEVEN
284	MSD0164-LS	ORELAND MILL
285	MSD1020-PS	MUD LANE
287	MSD0112-PS	HASBROOK
290	MSD0198-PS	GARDEN TRACE
291	79465-LS	AUTUMN LAKE MHP
292	32626-LS	DAIRYMART STORE
293	MSD0111-LS	VALLEY VILLAGE

ID Number	Unit ID	Pump Station Name
298	104336B-LS	SHACKLETTE ELEMENTARY
340	MSD0072-LS	VILLA ANA
360	107691-LS	ELDERBERRY RIDGE
361	107667-LS	CHERRY BLOSSOM
380	MSD1042-PS	APPLE VALLEY
392	81844-PS	BOARD OF EDUCATION
408	MSD1183-PS	RIVERSIDE GARDENS
410	MSD1182-PS	WOODLAND-BARBER
423	MSD0277A-PS	DEREK R. GUTHRIE WQTC PS
431	MSD1147-PS	MOUNT WASHINGTON ROAD
441	64062-PS	QUAIL CHASE GOLF COURSE
442	MSD0103-PS	MCNEELY LAKE
449	50911A-PS	
450	50911B-PS	
465	112832-PS	GLOBAL PORT
476	MSD0055-LS	SHIVELY
477	107341-PS	BLUELICK OPTIMIST CLUB
478	MSD1143-LS	BAY HARBOR CT
494	MSD0130-PS	COOPER CHAPEL
504	MSD1013-PS	CINDERELLA
510	MSD1192-PS	WAL-MART SUPER CENTER #3610-00
3203	MSD0195-PS	JEFFERSON HILL
3842	42167-PS	AUTUMN LAKE PUMP STATION

Map Prepared by MSD GIS Services and Records

Map Created: 7-APR-2017

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two main interceptors, the Pond Creek Interceptor and the Mill Creek Interceptor. These areas are currently modeled separately using Infoworks ICM. The models are calibrated and can be used to predict the increased flows during wet weather when inflow and infiltration peaks.

3.3 COMBINED DRG WQTC AND MFWQTC PLANNING AREA

The DRG WQTC service area increases in size during wet weather. During rain events, flow is diverted at the Northern Ditch Pump Station Diversion Structure in order to reduce flow to the MF WQTC for the reduction of Combined Sewer Overflows (CSOs). Figure 2-1 shows the dry weather service area and the wet weather diversion area.

3.4 GEOLOGY AND GROUNDWATER

The planning area lies within the Ohio River Alluvium physiographic region of Kentucky. The Ohio River Alluvium is primarily made up of Pleistocene glacial outwash material and unconsolidated alluvium, which consists of sand, gravel, clay, and silt. Regionally, the lithology is comprised of a 5 to 45-feet thick layer of clay, silt, and fine sand that overlays sand and gravel containing discontinuous lenses of clay. Beneath the aquifer are relatively tight shale and limestone bedrock (USGS, 1986).

3.5 TOPOGRAPHY AND FLOODPLAIN

The planning area is divided into two watersheds, Mill Creek watershed and Pond Creek watershed. Figure 3-2 shows a visual depiction of the terrain through color shading. The Mill Creek area is relatively flat, with low, undulating features. Portions of the Pond Creek watershed contain gentle to steeply graded hills, underlain with limestone. These are primarily in the southern and easternmost areas.

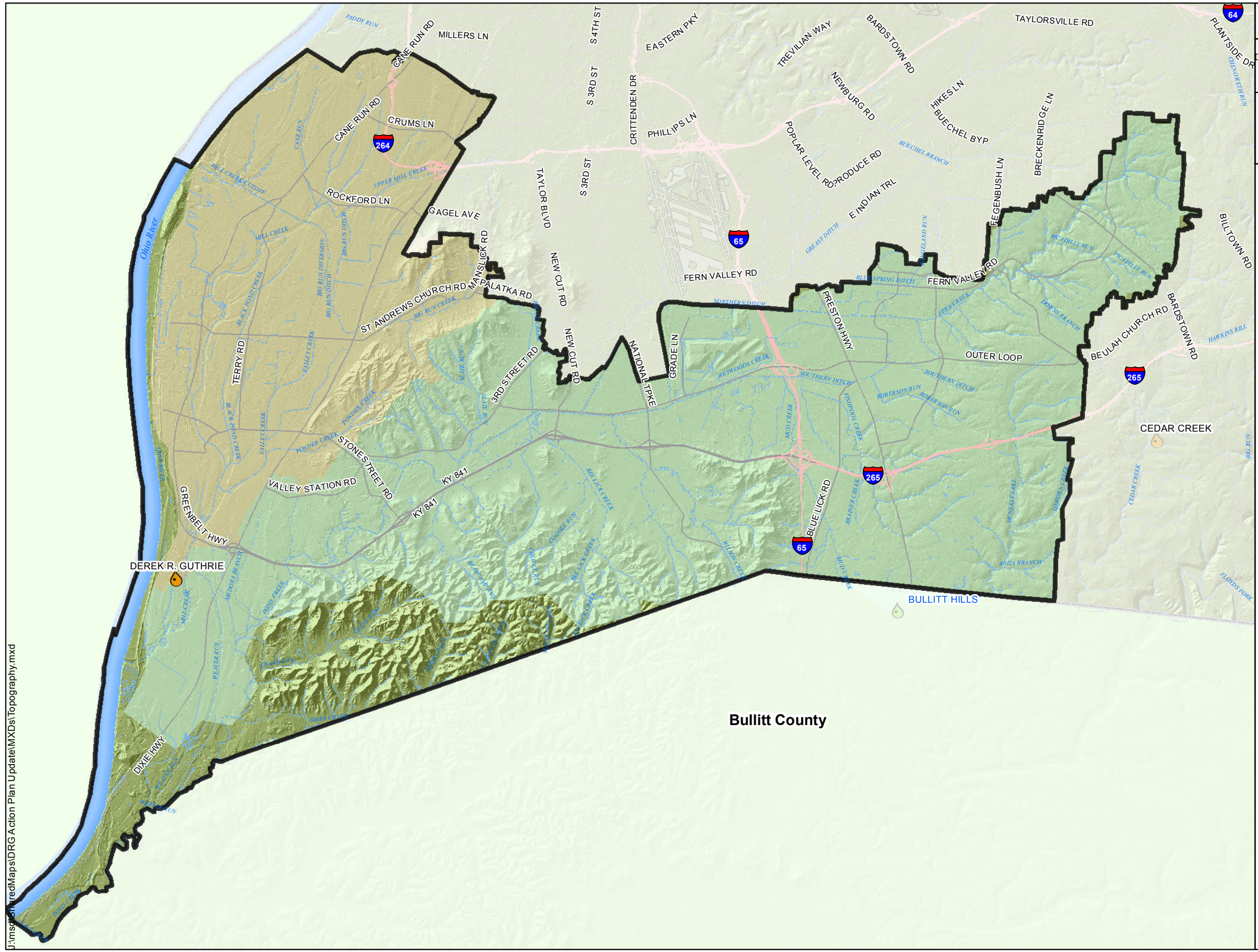
The Mill Creek area encompasses 34 square miles with 71 stream miles. The relatively flat and low relief terrain of the old Ohio River floodplain characterizes the landscape. Mill Creek and Black Pond Creek drain the northern portion of the basin. Black Pond Creek empties into Mill Creek near Valley Station. The cumulative flow discharges into the Ohio River near the DRG WQTC. Figure 3-3 shows a USGS map with contour lines and other physical characteristics of the area.

The floodplain consists of slack water areas, very flat terraces and old ridges deposited by the river as shown in Figure 3-4. Slopes are generally in the 0 to 5 degree range. The shallow valleys of small streams flowing into the Ohio River cut the broad, level ridges. The area is underlain by glacial outwash, where the upper deposits consist of recent alluvium of sand, silt and clay. The underlying sand and gravel act as a very extensive aquifer and most groundwater flow in the area occurs in the glacial, granular materials of the river valley.

Figure: 3-2

DEREK R. GUTHRIE FACILITES PLAN UPDATE
LOUISVILLE AND JEFFERSON COUNTY
METROPOLITAN SEWER DISTRICT

TOPOGRAPHY



- MSD Regional Treatment Plant
- MSD Treatment Plant
- Private Treatment Plant
- Streams
- Expressway
- Major Roads
- Jefferson County Boundary
- Pond Creek Watershed
- Mill Creek Watershed
- Planning Area Boundary

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1 inch equals 1.5 miles

Map Prepared by MSD GIS Services and Records

Map Created: 7-APR-2017

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Figure: 3-3

DEREK R. GUTHRIE FACILITES PLAN UPDATE
LOUISVILLE AND JEFFERSON COUNTY
METROPOLITAN SEWER DISTRICT

USGS

Louisville West

- MSD Regional Treatment Plant
- MSD Treatment Plant
- Private Treatment Plant
- Streams
- Expressway
- Major Roads
- Jefferson County Boundary
- Planning Area Boundary

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0 0.75 1.5 Miles

1 inch equals 1.5 miles

Map Prepared by MSD GIS Services and Records

Map Created: 7-APR-2017

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Figure: 3-4

DEREK R. GUTHRIE FACILITES PLAN UPDATE
LOUISVILLE AND JEFFERSON COUNTY
METROPOLITAN SEWER DISTRICT

100-YEAR FLOOD PLAIN

- MSD Regional Treatment Plant
- MSD Treatment Plant
- Private Treatment Plant
- Streams
- Expressway
- Major Roads
- Jefferson County Boundary
- Pond Creek Watershed
- Mill Creek Watershed
- Currently Not Serviced
- Planning Area Boundary
- Floodplain
- Floodway

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0 0.75 1.5 Miles

1 inch equals 1.5 miles

Map Prepared by MSD GIS Services and Records

Map Created: 7-APR-2017

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However, the recent alluvium deposited over the glacial material is frequently fine-grained, predominantly silt and silty clay loam. The infiltration of the water into these underlying materials is irregular and occurs only where the surface materials are clean, granular soil. Consequently, most of the area experiences deep seated groundwater flow with significant runoff. The floodplain's flat, broad ridges and terraces would constitute an ideal recharging area, if it were not for the widespread deposit of recent alluvium consisting of virtually impermeable silt and clays. The extensive areas of fine grain silt and clay causes predominantly surface runoff and evapotranspiration.

The Mill Creek watershed area is part of the Ohio River Floodplain, with a flood hazard area of 3.5 square miles. Most flooding occurs during the 4 month period from January through April. All of the high floods have occurred during this period.

The Pond Creek watershed encompasses 63 square miles and is roughly shaped like a rectangle with a finger that extends northeast. On average, the dimensions of the Pond Creek area are 17.1 miles from east to west and 3.7 miles from north to south.

The Pond Creek watershed contains a variety of topographical features. The eastern portion of the area is marked by karst prone topography, where small sinkholes are common. The karst topography also provides rolling hills that drain into flat areas in the northern portion of the Pond Creek watershed. The moderately steep rolling hills allow run-off to reach the flat plain areas quickly, where the flat areas serve as local floodplains for many streams and drainage channels. Slopes within the rolling hills are typically between four and 8 percent with elevations up to 600 feet but commonly near 500 feet. Elevations in the flat plains are in the range of 420 to 460 feet, which provide minimal topographic relief for the streams and channels to reach the Salt River and ultimately the Ohio River. The southern portion of the Pond Creek planning area includes the karst prone steep hills of the Jefferson County Memorial Forest that commonly contain elevations of 850 feet (National Geodetic Vertical Datum of 1929).

To reduce losses due to flooding and control development within the floodplain, Jefferson County and other agencies, including U.S. Army Corps of Engineers, have pursued flood damage reduction measures. The county floodplain ordinance discourages and restricts development in the floodplain and floodway. The U.S. Army Corp of Engineers has managed the development of two detention basin sites, Melco and Vulcan. The Melco Basin is located at Northern Ditch just south of the Ford Plant near Grade Lane and Outer Loop. The other basin was developed from the former Vulcan Limestone Quarry, located on Fishpool Creek near Blue Lick Road and South Park Road. Both basins provide additional flood protection for residents near the Northern and Southern ditches.

The purpose of floodplain regulation is to prevent construction in the floodplain or floodways. Construction in the floodplain and floodways increases flooding frequency and depth. In 1978, Jefferson County adopted its first floodplain management controls. In 1987, MSD became responsible for drainage controls in the area.

3.6 PLANNING AND ZONING

Land function can provide insight into the current areas of development, undeveloped areas, agricultural presence and forested regions. Two references were used that provided details on the DRG WQTC Planning area land use characteristics; Figure 3-5 Land Use and Figure 3-6 Zoning. Apparent differences or conflicts between the two can be attributed to several reasons, including land uses established prior to zoning regulations, or to approved variances through the planning process.

3.7 NATIONAL LAND COVER DATA 2011

Federal agencies partnered to produce a nationwide land use land cover geographical information system (GIS) shapefile called National Land Cover Dataset 2001 (nlcd01). Aerial photography on a 30-meter grid was analyzed for land use and classified into 16 categories according to the Anderson Land Use/Land Cover Classifications. The DRG WQTC planning area land use result demonstrates high percentages of Single Family Residential and Vacant land covering a total of 87.9 percent as shown in Table 3-1 and Figure 3-5. The developed land area classifications are 92.1 percent.

Table 3-1 2011 National Land Use Data

Category	Area (Acres)	Percent (%)
Commercial	2,162	2.7%
Farmland	276	0.3%
Industrial	883	1.1%
Multi-Family Residential	980	1.2%
Parks and Open Space	947	1.2%
Public and Semi Public	2,097	2.6%
Right of Way	2,336	2.9%
Single Family	65,182	81.5%
Vacant	5,132	6.4%
Total	**79,995**	**100%**

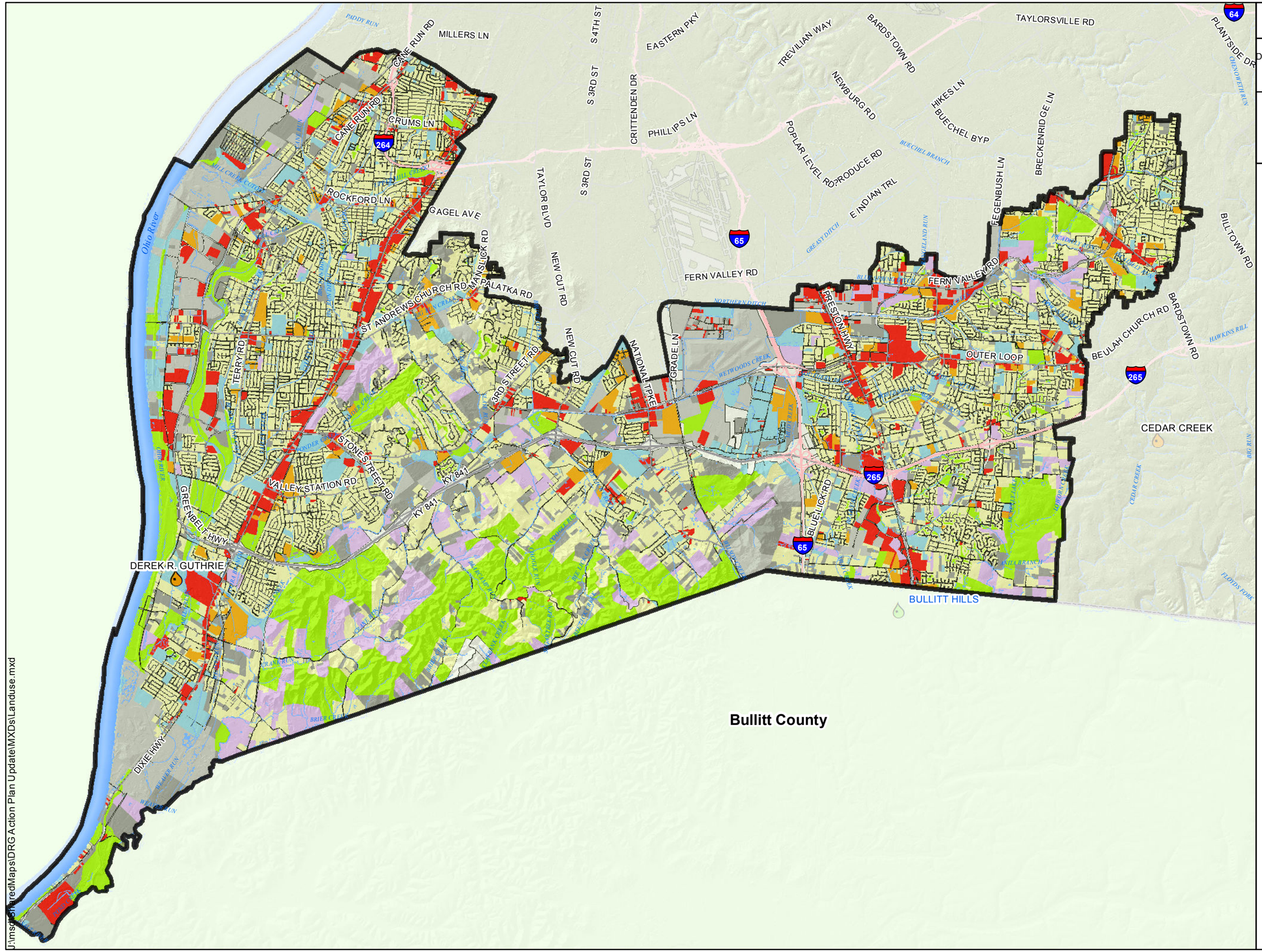
3.8 LOUISVILLE METRO ZONING

The DRG WQTC planning area is divided into Metropolitan Zoning types as shown in Table 3-2 and Figure 3-6. Residential is the dominant zoning classification in the DRG planning

Figure: 3-5

DEREK R. GUTHRIE FACILITES PLAN UPDATE
LOUISVILLE AND JEFFERSON COUNTY
METROPOLITAN SEWER DISTRICT

LAND USE



- MSD Regional Treatment Plant
- MSD Treatment Plant
- Private Treatment Plant

Landuse *

- Commercial
- Industrial
- Mulit-Family Res
- Parks and Open Space
- Public and Semi-public
- Farmland
- Single Family Res
- Right-of-way
- Vacant or Undeveloped
- Streams
- Expressway
- Major Roads
- Jefferson County Boundary
- Planning Area Boundary

Note:
** Landuse is based on National Land Cover Data 2011*

N
W E
S

0 0.75 1.5 Miles

1 inch equals 1.5 miles

Map Prepared by MSD GIS Services and Records

Map Created: 7-APR-2017

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Figure: 3-6

DEREK R. GUTHRIE FACILITES PLAN UPDATE
LOUISVILLE AND JEFFERSON COUNTY
METROPOLITAN SEWER DISTRICT

ZONING

MSD Regional Treatment Plant
MSD Treatment Plant
Private Treatment Plant

Zoning

- Commercial/Industrial
- Industrial Only
- Business/Office
- Residential
- Special
- Streams
- Expressway
- Major Roads
- Jefferson County Boundary
- Planning Area Boundary

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0 0.75 1.5 Miles

1 inch equals 1.5 miles

Bullitt County

DEREK R. GUTHRIE

BULLITT HILLS

CEDAR CREEK

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Map Prepared by MSD GIS Services and Records

Map Created: 7-APR-2017

area. The commercial industrial and industrial areas are clustered buffering the major roads and transportation corridors. Zoning areas are not anticipated to significantly change as the watershed develops.

Table 3- 2 Metro Zoning Areas

Category	Area (Acres)	Percent
Commercial- Industrial	9,199.43	11.5%
Industrial Only	4,399.73	5.5%
Business/Office	239.99	0.3%
Residential	63,916.01	79.9%
Special	639.96	0.8%
Other	1,599.90	2.0%
Total	79,995.00	100%

SECTION 4: SOCIOECONOMIC CHARACTERISTICS

4.1 HISTORIC POPULATION

Population data is collected every ten years by the United States Census Bureau. Based on this data, Jefferson County experienced a period of steady growth between 1800 and 1970. Figure 4-1 shows the upward population trend of the county. Since 1970, Jefferson County's population generally stabilized and ranged between approximately 664,000 and 741,100. The future growth in Jefferson County is projected by the University of Louisville Urban Studies Institute to be 13.4 percent over the time period 2015 – 2035. The eastern part of the county is considered to have the greatest potential for future development. The southwestern area of the county (the DRG WQTC service area) is not anticipated for large residential or commercial developments.

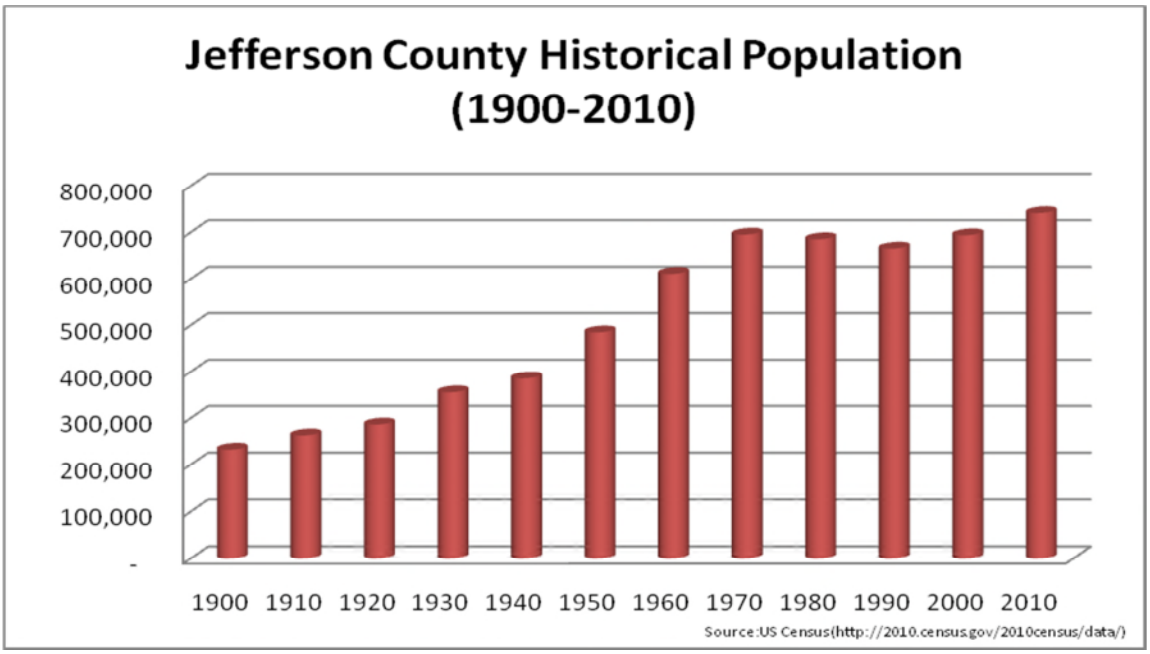

Figure 4-1 Census Data Populations for Jefferson County

4.2 CURRENT AND PROJECTED POPULATIONS

The University of Louisville Urban Studies Institute includes the Kentucky Data Center, which provides United States Census Bureau population data and projects future population growth. Figure 4-2 shows the projected growth in the DRG WQTC service area and the wet weather

diversion area. The dry weather service area is projected to grow from approximately 202,000 people to approximately 218,000, an 8 percent increase over the next 20 years. The total service area is projected to grow from approximately 212,000 people to approximately 228,500, 7.8 percent over the next 20 years for the full service area. Note that this is the change in population, not the net change in customers. The growth in MSD customers served by the DRG WQTC is anticipated to grow at a slightly higher rate due to the elimination the conversion of properties currently on septic tanks to full sewer service. See Figure 4-3 for a map of existing MSD sewer connections.

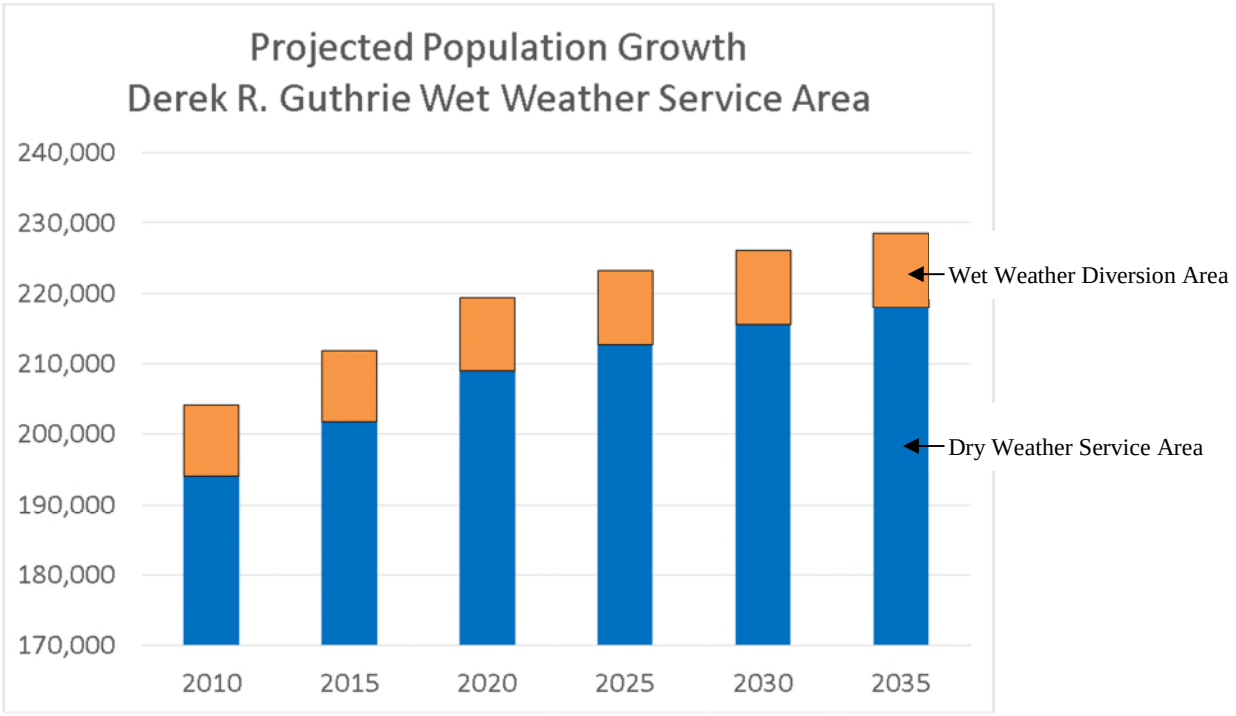

Figure 4-2 DRG WQTC Service Area Population Projections

4.3 CURRENT AND PROJECTED INDUSTRIAL USERS

There are twenty (19) General Discharge Permitted (GDP) and Significant Industrial Users (SIU) listed in Table 4-1 that discharge process wastewater to DRG WQTC. Federal categorical industries that discharge pretreatment categorical wastewater are Metal Finishers (40 CFR 433), Centralized Waste Treatment (40 CFR 437), Aluminum Forming (40 CFR 467), and Organics, Chemicals Plastics and Synthetic Fibers (40 CFR 414). All permitted industrial users have to meet applicable limits for federal categorical and/or local limits developed for

Figure: 4-3

DEREK R. GUTHRIE FACILITES PLAN UPDATE
LOUISVILLE AND JEFFERSON COUNTY
METROPOLITAN SEWER DISTRICT

EXISTING MSD SEWER CONNECTIONS

- MSD Sewer Connections
- MSD Regional Treatment Plant
- MSD Treatment Plant
- Private Treatment Plant
- Streams
- Expressway
- Major Roads
- Jefferson County Boundary
- Pond Creek Watershed
- Mill Creek Watershed
- Currently Not Serviced
- Planning Area Boundary

N
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0 0.75 1.5 Miles

1 inch equals 1.5 miles

Map Prepared by MSD GIS Services and Records

Map Created: 7-APR-2017

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DRG WQTC based on KPDES effluent limits and Water Quality Standards for the Ohio River. There are no projected or pending industrial developments in the DRG WQTC planning area.

Table 4-1 DRG WQTC Service Area Industrial Users

Biorigin/PTX Foods Corp	Conco, Inc.	Nth Works - Preston Plant
Bluegrass Kesco, Inc.	Dafco Inc.	Republic Conduit Manufacturing
Interpolymer Corporation	CSX Corporation	Rivergreen Water
Russtech Admixtures, Inc.	Interpolymer Corp.	Saint - Gobain Quartz
Cardinal Aluminum Finishing	Kentucky Trailer	Waste Management of KY
Cintas Corp	Multicorr	Yamamoto FB Engineering
NHK Spring Precision		

4.4 ECONOMIC OR SOCIAL BENEFIT

By developing the RFP for projected sewage conveyance and treatment needs, both ratepayer and environmental interests in the community are protected. The plan identifies the infrastructure needs, general alignments and sizing necessary to safely convey raw sewage from undeveloped areas to the regional facility for treatment and discharge under a KPDES permit. The plan defines a reasonable expectation for development as a foundation for review and more detailed evaluations. This approach to future treatment and conveyance needs considers the financial and environmental burden borne by existing sewer district customers.

SECTION 5: EXISTING ENVIRONMENT

5.1 PHYSICAL FEATURES

The physical features of the DRG WQTC dry weather service area are described in this section. The features of interest are Lakes and Streams, Water Quality, Air Pollution and Geology.

5.1.1 Lakes and Streams

The planning area flows towards the Ohio River from northeast to southwest. The major watershed streams are Mill Creek and Pond Creek. According to Louisville and Jefferson County Information Consortium (LOJIC), the planning area has 105 stream miles and 230 acres of lakes. The streams in the planning area are shown in Figure 5-1.

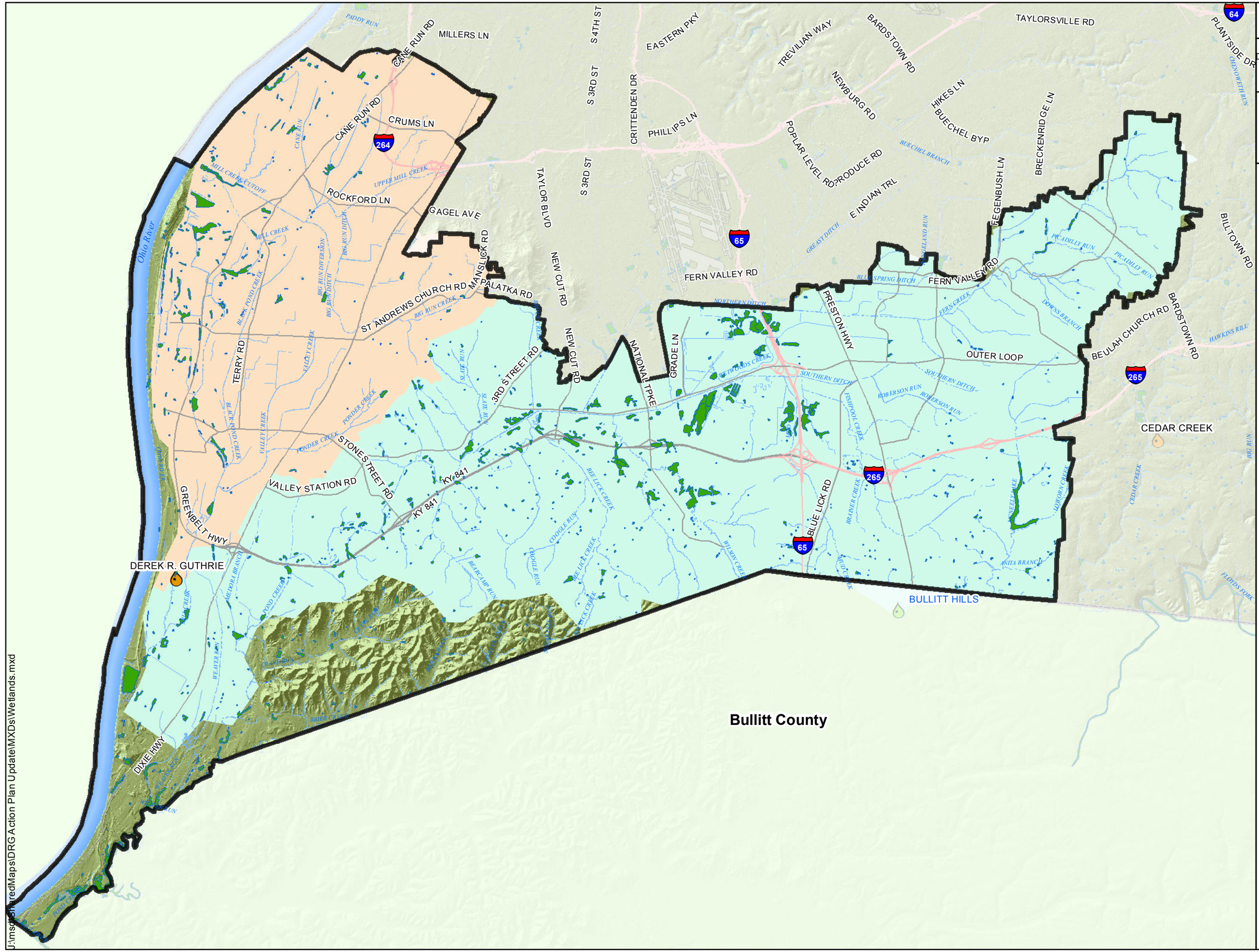
5.1.2 Water Quality

Water quality of the streams and lakes are monitored by the KDEP and reported to Congress through the Integrated Water Quality 305(b) report as a requirement of the Clean Water Act (CWA). The impaired streams in the planning area are shown in Figure 5-2. The 303(b) (Table 5-1) list identifies impaired and threatened waters based on KDOW's water quality monitoring, totaling 43.5 miles of impaired streams. The 303(b) list includes the stream segment, impairments, and list of potential sources. By and large, the DRG WQTC planning area was classified as impaired. The impairments listed are elevated levels of nitrogen and phosphorus (common components of fertilizers and detergents), urban runoff, diminished oxygen levels and loss of stream bank vegetation which results in warmer water temperatures. These conditions are caused by both point and non-point sources. Once a stream is listed on the 303(b) list, a total maximum daily load (TMDL) evaluation may be conducted. A TMDL is a calculation of the maximum amount of a pollutant that water body can receive and still safely meet water quality standards, and an allocation of the load among the various sources of the pollutant.

Figure: 5-1

DEREK R. GUTHRIE FACILITES PLAN UPDATE
LOUISVILLE AND JEFFERSON COUNTY
METROPOLITAN SEWER DISTRICT

WETLANDS



MSD Regional Treatment Plant
MSD Treatment Plant
Private Treatment Plant
Streams
Expressway
Major Roads
Jefferson County Boundary
Pond Creek Watershed
Mill Creek Watershed
Currently Not Serviced
Planning Area Boundary
Wetlands

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0 0.75 1.5 Miles

1 inch equals 1.5 miles

Map Prepared by MSD GIS Services and Records

Map Created: 7-APR-2017

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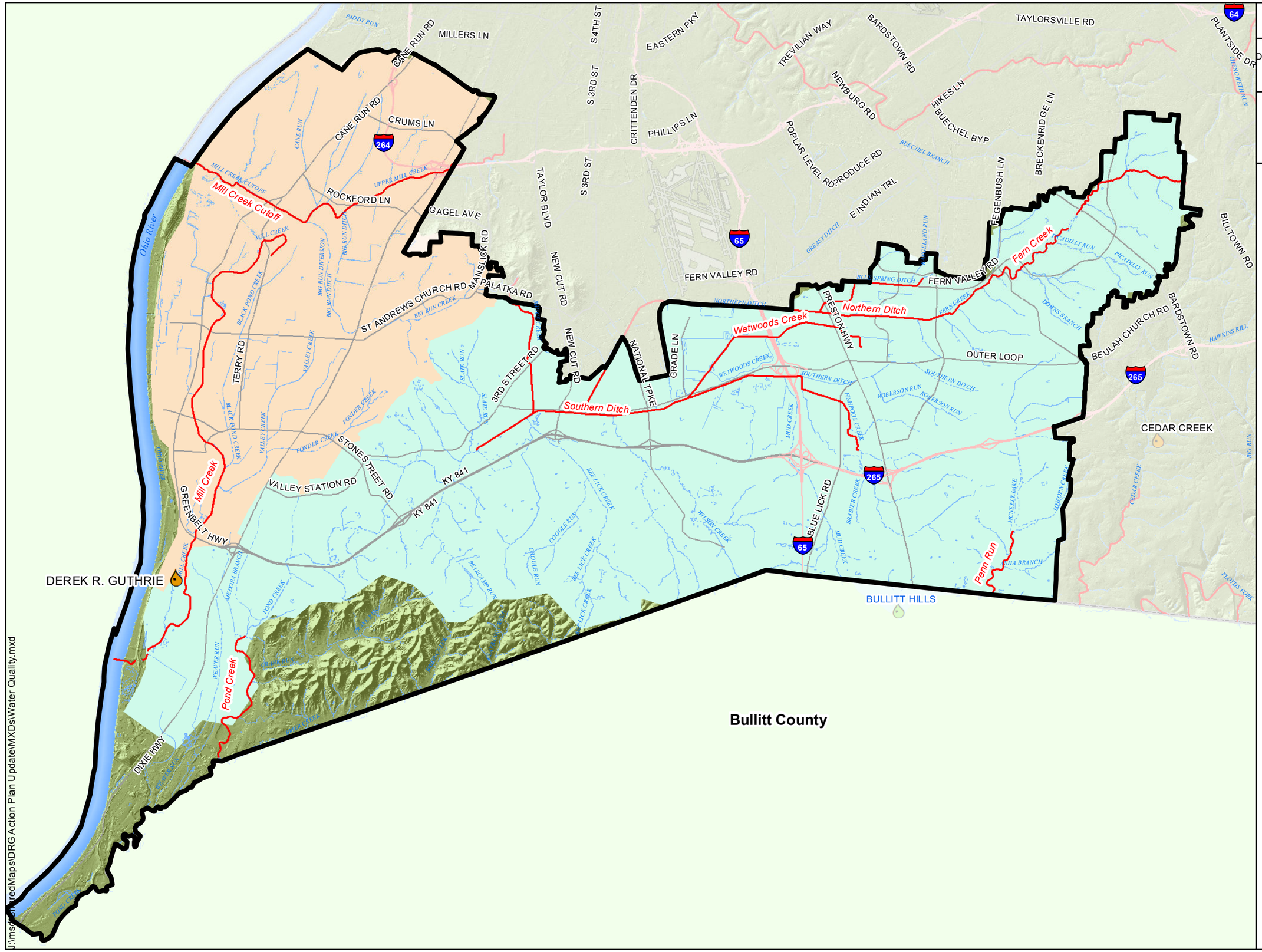
Figure: 5-2

DEREK R. GUTHRIE FACILITES PLAN UPDATE
LOUISVILLE AND JEFFERSON COUNTY
METROPOLITAN SEWER DISTRICT

WATER QUALITY IMPAIRED STREAMS



- MSD Regional Treatment Plant
- MSD Treatment Plant
- Private Treatment Plant
- 305b Streams Impaired, TMDL Required
- Streams
- Expressway
- Major Roads
- Jefferson County Boundary
- Pond Creek Watershed
- Mill Creek Watershed
- Currently Not Serviced
- Planning Area Boundary

N
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0 0.75 1.5 Miles

1 inch equals 1.5 miles

Map Prepared by MSD GIS Services and Records

Map Created: 7-APR-2017

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Table 5-1 303(d) Impaired Streams (2012)

Stream	Steam Miles	Impaired Use(s)	Pollutant Name	Source Name
Blue Spring Ditch 0.0 to 2.1	2.15	Primary Contact Recreation Water (Nonsupport)	Fecal Coliform	Municipal Point Source Discharges; Urban Runoff/Storm Sewers
Fern Creek 1.3 to 4.4	3.10	Warm Water Aquatic Habitat (Nonsupport); Primary Contact Recreation Water (Nonsupport)	Fecal Coliform; Nutrient/Eutrophication Biological Indicators; Organic Enrichment (Sewage) Biological Indicators	Illegal Dumps or Other Inappropriate Waste Disposal; Landfills' Municipal Point Source Discharges; Urban Runoff/Storm Sewers
Fern Creek 0.0 to 1.3	1.22	Warm Water Aquatic Habitat (Partial Support); Primary Contact Recreation Water (Nonsupport)	Ammonia (Un-ionized); Fecal Coliform; Nutrient/Eutrophication Biological Indicators; Organic Enrichment (Sewage) Biological Indicators	Landfills; Municipal Point Source Discharges; Unspecified Urban Stormwater
Fern Creek 4.4 to 5.9	0.84	Warm Water Aquatic Habitat (Partial Support); Primary Contact Recreation Water (Nonsupport)	Fecal Coliform; Nutrient/Eutrophication Biological Indicators; Organic Enrichment (Sewage) Biological Indicators	Illegal Dumps or Other Inappropriate Waste Disposal; Municipal Point Source Discharges; Urban Runoff/Storm Sewers
Mill Creek 0.0 to 11.2	9.95	Warm Water Aquatic Habitat (Nonsupport); Primary Contact Recreation Water (Nonsupport)	Fecal Coliform, Nutrient/Eutrophication Biological Indicators, Organic Enrichment (Sewage) Biological Indicators	Illegal Dumps or Other Inappropriate Waste Disposal, Industrial Point Source Discharge, Municipal Point Source Discharges, Urban Runoff/Storm Sewers
Mill Creek Cutoff 0.0 to 6.7	5.37	Primary Contact Recreation Water (Nonsupport)	Fecal Coliform	Illegal Dumps or Other Inappropriate Waste Disposal; Municipal Point Source Discharges; Urban Runoff/Storm Sewers
Northern Ditch 0.0 to 7.3	4.96	Warm Water Aquatic Habitate (Partial Support); Primary Contact Recreation Water (Nonsupport)	Ammonia (Un-ionized); Fecal Coliform; Nutrient/Eutrophication Biological Indicators; Organic Enrichment (Sewage) Biological Indicators	Illegal Dumps or Other Inappropriate Waste Disposal; Municipal Point Source Discharges; Urban Runoff/Storm Sewers
Pond Creek/Southern Ditch 5.1 to 8.1	2.89	Warm Water Aquatic Habitat (Nonsupport); Primary Contact Recreation Water (Nonsupport)	Ammonia (Un-ionized); Fecal Coliform; Nutrient/Eutrophication Biological Indicators; Organic Enrichment (Sewage) Biological Indicators	On-site Treatment Systems (Septic Systems and Similar Decentralized Systems); Package Plant or Other Permitted Small Flow Discharges; Unspecified Urban Stormwater
Southern Ditch 0.0 to 5.9	5.78	Primary Contact Recreation Water (Nonsupport)	Fecal Coliform	Illegal Dumps or Other Inappropriate Waste Disposal; Municipal Point Source Discharges; Urban Runoff/Storm Sewers
UT to Southern Ditch 0.0 to 2.6	2.18	Warm Water Aquatic Habitat (Nonsupport)	Sedimentation/Siltation	Channelization; Commercial Districts (Industrial Parks); Commercial Districts (Shopping/Office Complexes); Highway/Road/Bridge Runoff (Non-construction Related); Impacts from Hydrostructure Flow Regulation/modification; Impervious Surface/Parking Lot Runoff
Wetwoods Creek (Slop Ditch) 0.0 to 3.7	3.73	Warm Water Aquatic Habitat (Partial Support); Primary Contact Recreation Water (Nonsupport)	Cadmium; Fecal Coliform	Industrial Point Source Discharges; Municipal Point Source Discharges; Urban Runoff/Storm Sewers

MSD collects and evaluates water quality data within Jefferson County. Water quality data and analysis is available through 2013. A copy of the latest Water Quality Synthesis Report for Jefferson County can be found on MSD's Project WIN website under the Consent Decree Reporting folder in the Library.

The Ohio River is hydraulically connected to the Ohio River Alluvium aquifer. Small streams in the area also influence the aquifer but to a much lesser degree than the Ohio River. Recharge to the aquifer occurs through flow from small streams, valley walls, precipitation, and infiltration from the Ohio River during high river stages and periods of high groundwater withdrawal. Discharge of the aquifer occurs to the Ohio River and production wells (Unthank, 1998).

Wetlands occur throughout the planning area and are shown in Figure 5-1. During construction of the DRG WQTC Wet Weather Treatment Project, wetlands on the plant site were marked, mitigated and/or protected during the construction period. All wetlands encountered on infrastructure projects will be similarly evaluated, marked and protected or mitigated through other jurisdictional processes.

5.1.3 Air Pollution

Air quality and water quality are linked through air pollution in our waterways. Air pollution can derive from activities such as driving cars, burning coal and manufacturing chemicals. Airborne pollutants are deposited on the land. After a rain, pollutants are transported into our water bodies. Such pollutants can be harmful to fish and other aquatic life.

The Clean Air Act, last amended in 1990, sets the national air quality standards. There are seven pollutant categories: Carbon Monoxide, Lead, Nitrogen Dioxide (NO2), Particulate Matter PM10, Particulate Matter PM2.5, Ozone (O3) and Sulfur Dioxide (SO2). If these pollutants exist in high quantities, public health concerns are raised.

In Jefferson County, the Air Pollution Control District (APCD) monitors the air quality at seven locations. There is one active site within the DRG WQTC planning area at Watson Lane collecting air pollution data on O3, SO2 and PM2.5. According to an article titled "Air Quality in Louisville: Past, Present, and Future" (2002) written by an APCD staff member, the air quality is in compliance with the National Ambient Air Quality Standards NAAQS. Air quality has improved over the past 30 years. MSD does currently hold a minor source permit for odor control devices at the DRG WQTC.

5.1.4 Soils

Soils in a region impact the waters' ability to be absorbed into the ground. Soil types are typically categorized by three different soil textures: sand, silt and clay. If an area has predominately clay soils, there is a higher incidence of runoff. If the soils are predominantly sandy, there is a higher incidence of infiltration. There is a variety of runoff potential of soils present in the DRG WQTC planning area as shown on Figure 5-3. Figure 5-7 shows the planning area with the soils mapped with the corresponding NRCS soil classification. The soils in the DRG planning area are predominantly clay, silty clay and sand with slow to moderate runoff potential. This is due to the high clay content which reduces absorption.

Septic tank absorption fields are designed based on the rate at which the soils infiltrate the water. Sand transmits the water the fastest and clay is the slowest. A standard drain field cannot be located in clay soil. Lots with septic tanks are evaluated on a site by site basis to determine local soil conditions. Septic tank soil suitability is shown on Figure 5-4 based on ratings provided by the USGS. Based on this figure, it appears that the majority of the planning area has very limited or unrated suitability for on-site disposal systems.

5.1.5 Geology

Geology and groundwater play a role in how the surface water and groundwater interface. The amount of karst topography indicates interaction between the surface and groundwater. The groundwater is the water that seeps down through the soil until it reaches rock materials that are saturated with water. The majority of the DRG WQTC planning area is defined as non-karst with the exception of the eastern and southern portions which are shown as prone to karst formation, as shown in Figure 5-5.

The Ohio River Alluvium is the most dependable source of groundwater for Jefferson County. Domestic wells drilled in the alluvium are generally drilled to a depth of 100 feet below ground surface and can produce approximately 1,000 gallons of water per minute. Of the domestic wells located in the upland region outside of the alluvium, less than half produce adequate amounts of water for domestic purposes and often suffer during dry periods (Davidson, 2004).

5.2 BIOLOGICAL

5.2.1 Plants and Animal Communities

A number of threatened and endangered species are found in Jefferson County. Species likely to be present in the planning area are the Indiana Bat, Gray Bat, and the Clubshell mussel. In the previous expansion to DRG WQTC, care was taken to avoid disturbance to the local bat

Figure: 5-3

DEREK R. GUTHRIE FACILITES PLAN UPDATE
LOUISVILLE AND JEFFERSON COUNTY
METROPOLITAN SEWER DISTRICT

RUNOFF POTENTIAL

- MSD Regional Treatment Plant
- MSD Treatment Plant
- Private Treatment Plant
- Streams
- Expressway
- Major Roads
- Jefferson County Boundary
- Planning Area Boundary

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0 0.75 1.5 Miles

1 inch equals 1.5 miles

B - The soils have a moderate infilitration rate when thoroughly wetted. They chiefly are moderately deep to deep, moderately well drained to well drained soils that have moderately fine to moderately coarse textures. They have a moderate rate of water transmission.

C - The soils have a slow infilitration rate when thoroughly wetted. They chiefly have a layer that impedes downward movement of water or have moderately fine to fine texture. They have a slow rate of water transmission.

D - (High runoff potential) The soils have a very slow infilitration rate when thoroughly wetted. They chiefly consist of clay soils that have a high swelling potential, soils that have a permanent high water table, soils that have a claypan or clay layer at or near the surface, and shallow soils over nearly impervious material. They have a very slow rate of water transmission.

A/D, B/D, and C/D - Dual hydrologic groups are given for certain wet soils that can be adequately drained. The first letter applies to the drained condition, the second to the undrained. Only soils that are rated D in their natural condition are assigned to dual classes. Soils may be assigned to dual groups if drainage is feasible and practical

NA - Not Applicable.

Map Prepared by MSD GIS Services and Records

Map Created: 7-APR-2017

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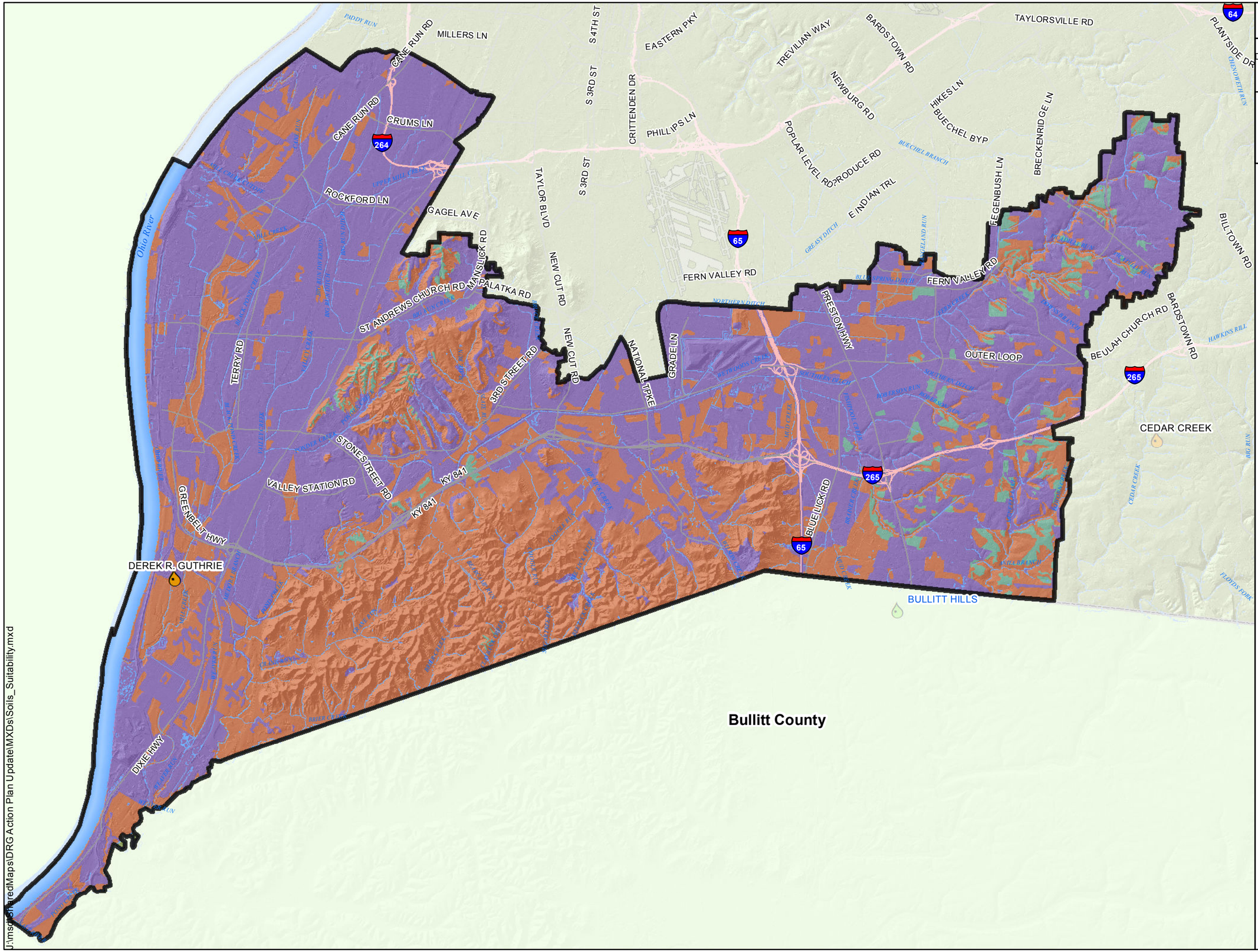
Figure: 5-4

DEREK R. GUTHRIE FACILITES PLAN UPDATE
LOUISVILLE AND JEFFERSON COUNTY
METROPOLITAN SEWER DISTRICT

SOILS SUITABILITY FOR ON-SITE TREATMENT



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MSD Regional Treatment Plant
MSD Treatment Plant
Private Treatment Plant
Streams
Expressway
Major Roads
Jefferson County Boundary
Planning Area Boundary

Soils - (Source USGS)

Not rated
Somewhat limited
Very limited

N
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0 0.75 1.5 Miles

1 inch equals 1.5 miles

Map Prepared by MSD GIS Services and Records

Map Created: 7-APR-2017

Figure: 5-5

DEREK R. GUTHRIE FACILITES PLAN UPDATE
LOUISVILLE AND JEFFERSON COUNTY
METROPOLITAN SEWER DISTRICT

KARST PRONE AREAS

- MSD Regional Treatment Plant
- MSD Treatment Plant
- Private Treatment Plant
- Streams
- Expressway
- Major Roads
- Jefferson County Boundary
- Pond Creek Watershed
- Mill Creek Watershed
- Planning Area Boundary

Geology - (Source USGS)

- Non Karst
- Prone to Karst
- Intense Karst

N
W E
S

0 0.75 1.5 Miles

1 inch equals 1.5 miles

Map Prepared by MSD GIS Services and Records

Map Created: 10-DEC-2014

Bullitt County

DEREK R. GUTHRIE

BULLITT HILLS

CEDAR CREEK

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populations during critical mating seasons. Similar measures will be implemented as necessary in all phases of development and construction identified in this RFP.

5.3 CULTURAL

5.3.1 Archaeological and Historic Resources

All required surveys will be completed for all planned projects prior to application for construction permits. The planned projects are not expected to disturb historic or archeological resources. Subject surveys and reports for any project within a 2 year window from the submission of this FPU will be attached in appendices to this report.

5.4 OTHER FEATURES

State Parks, Recreation areas, environmentally sensitive areas are listed in Table 5-2 and is shown in Figure 5-6.

Figure: 5-6

DEREK R. GUTHRIE FACILITES PLAN UPDATE
LOUISVILLE AND JEFFERSON COUNTY
METROPOLITAN SEWER DISTRICT

PARKS/RECREATIONAL AREAS

- MSD Regional Treatment Plant
- MSD Treatment Plant
- Private Treatment Plant
- Streams
- Expressway
- Major Roads
- Jefferson County Boundary
- Pond Creek Watershed
- Mill Creek Watershed
- Currently Not Serviced
- Planning Area Boundary
- Natural Areas
- State/Local Parks

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S

0 0.75 1.5 Miles

1 inch equals 1.5 miles

Bullitt County

Map Prepared by MSD GIS Services and Records

Map Created: 7-APR-2017

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Figure: 5-7

DEREK R. GUTHRIE FACILITES PLAN UPDATE
LOUISVILLE AND JEFFERSON COUNTY
METROPOLITAN SEWER DISTRICT

DRG SOILS

- MSD Regional Treament Plant
- MSD Treament Plant
- Private Treatment Plant
- Streams
- Major Roads
- Expressway
- Watershed Boundaries
- Jefferson County Boundary
- Project Boundary

N
W E
S

0 0.75 1.5 Miles

1 inch equals 7,920 feet

Bullitt County

Soil Taxonomy Classification

- Udorthents
- Fine-silty, mixed, superactive, mesic Ultic Hapludalfs
- Fine-silty, mixed, superactive, mesic Typic Endoaquolls
- Fine-silty, mixed, semiactive, mesic Typic Fragiudults
- Fine-silty, mixed, semiactive, mesic Typic Fragiaqualfs
- Fine-silty, mixed, semiactive, mesic Aquic Fragiudalfs
- Fine-silty, mixed, active, nonacid, mesic Fluventic Endoaquepts
- Fine-silty, mixed, active, nonacid, mesic Fluvaquentic Endoaquepts
- Fine-silty, mixed, active, mesic Ultic Hapludalfs
- Fine-silty, mixed, active, mesic Typic Paleudalfs
- Fine-silty, mixed, active, mesic Typic Hapludalfs
- Fine-silty, mixed, active, mesic Oxyaquic Fragiudalfs
- Fine-silty, mixed, active, mesic Fluventic Hapludolls
- Fine-silty, mixed, active, mesic Fluvaquentic Eutrudepts
- Fine-silty, mixed, active, mesic Dystric Fluventic Eutrudepts
- Fine-silty, mixed, active, mesic Aquic Fragiudalfs
- Fine-silty, mixed, active, mesic Aeric Fragiaqualfs
- Fine-loamy, mixed, semiactive, mesic Ultic Hapludalfs
- Fine-loamy, mixed, active, mesic Ultic Hapludalfs
- Fine-loamy, mixed, active, mesic Typic Hapludults
- Fine, mixed, active, nonacid, mesic Typic Endoaquepts
- Fine, mixed, active, mesic Typic Hapludalfs
- Fine, mixed, active, mesic Typic Argiudolls
- Coarse-loamy, mixed, active, nonacid, mesic Mollic Udifluvents
- Coarse-loamy, mixed, active, mesic Fluventic Hapludolls
- Not rated or not available

Map Prepared by MSD GIS Services and Records

Map Created: 9/27/2017

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Table 5- 2 State, Local Parks and Recreational Areas

Name	Type	ACRES
Alex Farnsley Golf Course	Recreation	27
Bethany Memorial	Cemetery	61
Black Mudd	Neighborhood Park	18
Blue Lick	Community Park	21
Blue Lick Optimist Park	Community Park	23
Bobby Nichols Golf Course	Recreation	109
Cane Run	Neighborhood Park	11
Different Strokes New Cut Road	Recreation	68
Fairdale Mini	Neighborhood Park	0.4
Farman	Neighborhood Park	4
Fern Creek	Community Park	30
Green Meadows Cemetery	Cemetery	50
Highview	Community Park	40
Jefferson Memorial Forest	Regional Park	4,974
Kulmer Reserve	Community Park	24
Lake Dreamland	Neighborhood Park	1.4
Louisville Memorial Gardens	Cemetery	56
McNeely Lake	Major Urban Park	741
Medora	Neighborhood Park	4
Nelson Hornbeck	Neighborhood Park	19
Okolona	Neighborhood Park	15
Penn Run Golf Course	Recreation	28
Resthaven Cemetery	Cemetery	1
Riverside Gardens	Neighborhood Park	10
Riverside, The Farnsley- Moreman Landing	Major Urban Park	301
Riverview	Community Park	46
Roberson Run	Neighborhood Park	14
Shively Park	Community Park	21
South Park County Club	Recreation	268
Sun Valley	Community Park	39
Sun Valley Golf Course	Recreation	166
Sylvania	Neighborhood Park	11
Waverly	Major Urban Park	188
Wildwood Country Club	Recreation	141
Woodhaven Country Club	Recreation	184
	TOTAL	7,700

SECTION 6: EXISTING WASTEWATER SYSTEM

6.1 ONSITE SYSTEMS

The DRG WQTC planning area contains sections in extreme southern and southwest Jefferson County that have on-site treatment systems, mostly septic tanks. These on-site wastewater treatment systems exist in areas yet to receive sewer service. One focus of this report has been planning and implementing sewer extensions to provide sewer service to these areas so that on-site systems will be eliminated. LOJIC data was used to estimate the number of addresses using septic tanks or other on-site treatment methods. The number of on-site treatment systems is the total number of addresses from the LOJIC database minus the total number of addresses estimated using MSD or private treatment facilities. It is estimated that 2,877 households are currently utilizing the on-site treatment system in the DRG WQTC planning area. Suspected locations of onsite systems are shown in Figure 6-1. There are no known or reported straight-pipe discharges in the DRG WQTC planning area in Jefferson County.

MSD has eliminated all private package treatment plants within the DRG WQTC planning area. The last remaining private treatment plants were Silver Heights WWTP (KY0029416) and McNeely Lake Treatment WWTP (KY0028801) which were eliminated in 2014 and 2016 respectively.

6.2 PHYSICAL CONDITIONS OF EXISTING WASTEWATER TREATMENT PLANTS

The DRG WQTC planning area includes one regional plant which is a major focus of this facilities plan. Flow projections, presented in Section 7 show projected flows for this planning period.

The DRG WQTC is located at 11601 Lower River Road. The WQTC effluent discharges to the Ohio River at mile point 358.1 (USACE river mile 623.3). The DRG WQTC was issued KPDES Permit No. KY0078956 that specifies the effluent limits for the facility. Table 6-1 summarizes the current KPDES effluent limits.

Figure: 6-1

DEREK R. GUTHRIE FACILITES PLAN UPDATE
LOUISVILLE AND JEFFERSON COUNTY
METROPOLITAN SEWER DISTRICT

SUSPECTED LOCATIONS OF ONSITE SYSTEMS

- Septic Tanks
- MSD Regional Treatment Plant
- MSD Treatment Plant
- Private Treatment Plant
- Streams
- Expressway
- Major Roads
- Jefferson County Boundary
- Pond Creek Watershed
- Mill Creek Watershed
- Currently Not Serviced
- Planning Area Boundary

N
W E
S

0 0.75 1.5 Miles

1 inch equals 1.5 miles

Map Prepared by MSD GIS Services and Records

Map Created: 7-APR-2017

U:\msd\SharedMaps\DRG Action Plan Update\MXDs\Septic_Tank_Location.mxd

Table 6-1 KPDES Permit Limits DRG WQTC

Parameter	Quantity or Loading (lb/day)		Quality or Concentration (mg/L)	
	Monthly Average	Weekly Average	Monthly Average	Weekly Average
Flow, Design (30 MGD)	-	-	Report	Report
Biochemical Oxygen Demand (5-day)	7506	11259	30	45
Total Suspended Solids	7506	11259	30	45
Fecal Coliform Bacteria (N/100 ml)	-	-	200	400
Ammonia (as N)	5004	7506	20	30
Phosphorus (as P)	Report	Report	-	-
TKN (as N)	Report	Report	-	-
Dissolved Oxygen not less than 2.0 mg/L				
Total Residual Chlorine (TRC)	-	-	0.019 Daily Max	0.019 Daily Max
Toxicity, Acute (Quarterly)				1.0 T_{ua}
pH Range	6.0-9.0			
% Removal of TSS	85%			
% Removal of BOD	85%			

6.2.1 DRG WQTC

The DRG WQTC was constructed to serve the residential, commercial/industrial and public users in the Mill Creek and Pond Creek Watersheds. DRG WQTC has been in service since 1985 with an initial capacity of 15 MGD. An expansion in 2004 increased the design annual average daily flow of 30 MGD. As part of the MSD's IOAP response to the ACD, the facility was expanded to receive peak flows up to 300 MGD, treating peak flows of 200 MGD and pumping flow in excess of 200 MGD to a 17 million gallon flow equalization basin. Excess wet weather flow is stored in the equalization basin until plant capacity exists for treatment, at which time the equalization basin is drained by gravity back into the Raw Wastewater Pump

Station. Construction of the improvements began in 2010 and the Wet Weather Treatment Facility was substantially operational in 2012.

The DRG WQTC is typically operated as a contact stabilization treatment facility. Influent flow receives preliminary treatment via screening and up to 200 MGD is pumped to grit removal. After grit removal, the wastewater flows by gravity to the aeration basin, where it is combined with return sludge in the contact basins. Flow then enters secondary clarification with return sludge entering into the stabilization basin. The clarifier overflow is directed to the sodium hypochlorite disinfection process and removal of chlorine residual before discharge to the Ohio River. The facilities added in 2010 - 2012 include a new 350 MGD screening facility, a new influent pump station with a firm capacity of 205 MGD, a wet weather pump station with a firm capacity of 114 MGD, short-term detention basin and a 17 million gallon flow equalization basin, expanded grit collection, one new aeration basin, six additional clarifiers, and expanded chlorination channels. Figure 6-2 shows a flow schematic of the plant. The design capacity for each treatment process is listed in Table 6-2. The peak flow capacity of the DRG WQTC is 200 MGD. In 2016 the plant averaged 35.0 MGD which is 58.3% of the requested 60.0 MGD permit capacity.

Table 6-2 Unit Process Design Capacity DRG WQTC

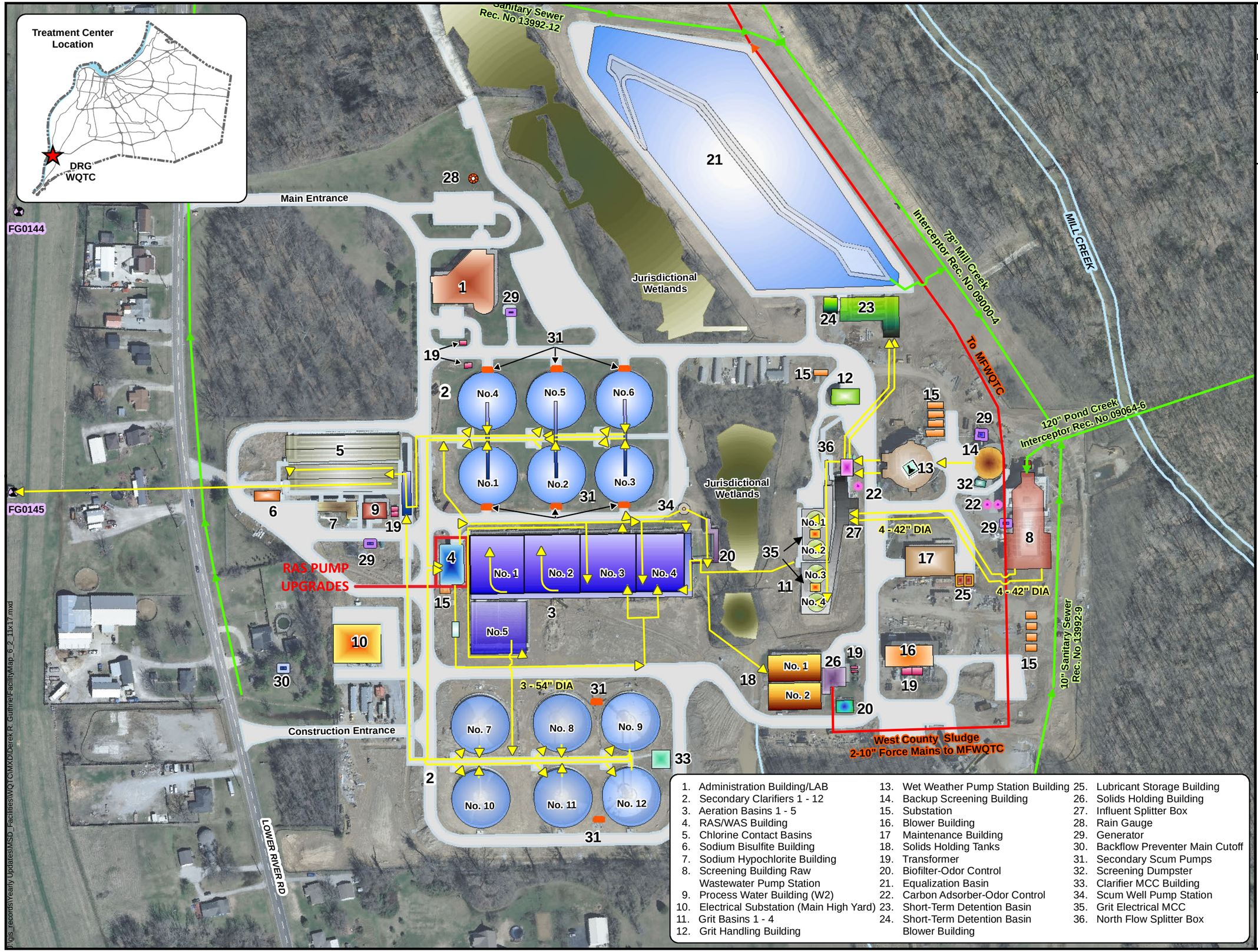
Unit Process	Description	Firm Capacity	Total Capacity
Bar Screens	3 Screens – 175 MGD each	350 MGD	525 MGD
Raw Wastewater Pumps	8 Pumps – 29.4 MGD @ 68.3 ft TDH	205 MGD	235 MGD
Wet Weather Pumps	3 Pumps – 25 MGD @ 68.4 ft TDH 2 Pumps – 39 MGD @ 67 ft TDH	114 MGD	153 MGD
Grit Basins	4 Basins – 50 MGD each		200 MGD
Aeration Basins	2 Stabilization Basins – 1.98 MG each (No. 3 and 4) 3 Contact Basins – 1.76 MG each (No 1, 2 and 5)		200 MGD
Clarifiers	12 Clarifiers – 130 ft diameter, 1.36 MG each		200 MGD
Secondary Sludge Pumps	2 pumps – 27 MGD 2 pumps - 8 MGD	43 MGD	70 MGD
Chlorine Contact	4 Basins – 50 MGD each		200 MGD

*Firm capacity applies to pumping facilities and is calculated with the largest one unit out of service.

Figure: 6-2

DEREK R. GUTHRIE FACILITES PLAN UPDATE
LOUISVILLE AND JEFFERSON COUNTY
METROPOLITAN SEWER DISTRICT

DEREK R GUTHRIE WATER QUALITY TREATMENT CENTER



1. Administration Building/LAB
2. Secondary Clarifiers 1 - 12
3. Aeration Basins 1 - 5
4. RAS/WAS Building
5. Chlorine Contact Basins
6. Sodium Bisulfite Building
7. Sodium Hypochlorite Building
8. Screening Building Raw Wastewater Pump Station
9. Process Water Building (W2)
10. Electrical Substation (Main High Yard)
11. Grit Basins 1 - 4
12. Grit Handling Building
13. Wet Weather Pump Station Building
14. Backup Screening Building
15. Substation
16. Blower Building
17. Maintenance Building
18. Solids Holding Tanks
19. Transformer
20. Biofilter-Odor Control
21. Equalization Basin
22. Carbon Adsorber-Odor Control
23. Short-Term Detention Basin
24. Short-Term Detention Basin Blower Building
25. Lubricant Storage Building
26. Solids Holding Building
27. Influent Splitter Box
28. Rain Gauge
29. Generator
30. Backflow Preventer Main Cutoff
31. Secondary Scum Pumps
32. Screening Dumpster
33. Clarifier MCC Building
34. Scum Well Pump Station
35. Grit Electrical MCC
36. North Flow Splitter Box

Flow Type

- Process
- Force Main
- Sanitary Sewer
- Streams
- Flood Gates

N E S W

0 100 200 Feet

1 inch equals 200 feet

NOTE:

This plan is intended to be a representation of plant flows. For more detailed information see Record Drawing No.12484

msd Safe, clean waterways

LOJIC Louisville/Jefferson County Information Consortium

Map Prepared by MSD GIS Services and Records

Map Created: 9/27/2017

Following is a unit process description of the existing water quality treatment center.

6.2.2 Raw Wastewater Pump Station

The Raw Wastewater Pump Station (RWPS) was constructed as part of the 2010 – 2012 expansion. The new influent pump station is equipped with 3 bar screens and 8 submersible pumps. For additional equipment specifications see Table 6-2. The structure and all equipment were commissioned in 2012. There are no known condition deficiencies that need to be addressed in the RWPS.

6.2.3 Wet Weather Pump Station

The Wet Weather Pump Station (WWPS) is located downstream from the RWPS. Screened raw wastewater that exceeds the capacity of the RWPS will flow by gravity through the Wet Weather Screening Building (WWSB) to the WWPS, where it is pumped to the Short Term Detention Basin (STDB). The WWPS has 3 pumps rated at 25 MGD and 2 pumps rated at 39 MGD, for a firm capacity of 114 MGD. All pumps were either new or totally reconditioned as part of the 2010 – 2012 expansion. During facility commissioning, vibration in excess of specified limits was identified. As of March 2017 this issue has still not been corrected, but MSD is working with the Contractor and the pump supplier under the terms of the construction contract to correct this condition.

The WWPS has identified deficiencies that are currently being addressed with the replacement of damaged switch gear. Additional manufacturer's equipment testing will be performed to address any other operational deficiencies. The heating, ventilation and air conditioning (HVAC) systems and elevators for both WWPS and WWSB have exceeded their original design life and should be considered for refurbishment or replacement. The WWSB building's drain system, including drain pumps, should be rebuilt. In addition, the screens in the WWSB were not anticipated to be used following the expansion. They were left in place following the expansion but were not refurbished. These screens should be considered for complete refurbishment if operating experience shows them to be useful in the expanded treatment process.

6.2.4 Facility Operations

Under normal operating conditions, flow up to 200 MGD is supplied to the plant by the RWPS. From there it is pumped, to the RWPS North Flow Splitter Box, through the influent channel, to one or more of the four grit removal basin influent channels equipped with Parshall flumes. In wet weather event flows in excess of 200 MGD, up to an additional 100 MGD is pumped by the WWPS to the WWPS Receiving Structure, where it flows to the Short Term Detention Basin (STDB). When the STDB is full, wastewater flows by gravity to the equalization basin (EQB). Ultimately, the capacity of the WWPS will be increased from the current 100 MGD to 150 MGD, bringing the total wet weather capacity of the plant to 350 MGD. It is not expected that this expansion will be required during the planning period covered by this RFP.

If the RWPS needs to be taken out of service for any reason, the WWPS can be used to supply flow to the plant at a rate up to 100 MGD. This can be accomplished by raising (closing) the gate on the RWPS Receiving Structure to isolate the RWPS and lowering (opening) the gate on the WWPS Receiving Structure to allow flow to enter the plant.

6.2.5 Grit Removal Facilities

The grit removal facilities include four parallel influent channels, Parshall flumes, grit removal basins, mechanisms, and grit pumps. Grit cyclones and grit classifiers are located in the Grit Handling Building. The grit facilities include four identical units capable of processing approximately 50 MGD of flow each.

The total capacity of the combined grit removal facilities is 200 MGD. While this does not provide firm capacity in the conventional sense, grit removal basins can operate for a short time without the grit scrapers and grit pumps, so all grit removal basins are likely to be available for short-term events except under unusual conditions. The capacity for this facility is also the capacity of the RWPS and the downstream secondary facilities. Wet weather influent flows in excess of 200 MGD are pumped to the STDB and/or the EQB by the WWPS.

The new grit handling facilities were commissioned in 2012. The existing grit handling equipment has received regular preventive maintenance and is functioning as intended. Future improvements should consider adding coarse bubble diffusers into the grit influent channel to maintain grit suspension. The HVAC system for the Grit Building should be considered for rehabilitation or replacement. There is a capacity issue with isolating flow from the grit basins to the aeration basins. The connection between the grit basins and the aeration basins is four

42-inch diameter pipes. These pipes are the controlling bottleneck that limits overall plant flow to 200 MGD. This condition should be monitored during wet weather events, and if it becomes serious enough to restrict flow below the rated peak flow of 200 MGD, process piping modifications should be made to eliminate this restriction. In addition, two of the 42-inch lines do not have the ability to be isolated from the grit tanks and the aeration basins. Sluice gates should be added to each end of the 42-inch lines that do not have them, to match the other two that can be isolated for maintenance and inspection.

6.2.6 Aeration Facilities

The activated sludge system typically operates in a contact stabilization mode. The return sludge from the secondary clarifiers passes through the stabilization basins (No. 3 and No. 4) before mixing with the incoming screened and de-gritted wastewater. The only difference between wet weather flow and dry weather flow is how many of the three contact basins are in service. The wet weather flow will mix with the return sludge in similar fashion in the common influent channel to the contact basins. Mixed liquor leaving the contact basin will flow by gravity to the secondary clarifiers via the flow conduits and clarifier control structures.

One of the aeration basins (#5) was commissioned in 2012. The other four basins were completely rehabilitated during that same construction project. There are no known condition deficiencies that need to be addressed in the aeration basins. Currently, however, the aeration basin influent channel can only be isolated from the main flow by installing stop logs to segment the channel. These stop logs are labor-intensive to install, and do not seal well enough to allow extended maintenance activities to be performed. These stop logs should be replaced with slide gates to facilitate channel cleaning and maintenance to be performed routinely.

The aeration blowers serving the contact and stabilization basins are four single stage centrifugal blowers. The blowers draw air from the existing plenum and discharge to the 60-inch aeration header. Flow control is accomplished at each aeration basin. Dissolved oxygen (DO) meters control the aeration basin influent air valves to maintain a preset DO concentration. A series of stainless steel air headers and fine bubble membrane diffusers cover the contact basin floor to allow for good mixing and oxygen transfer. Plant staff report problems with leaking gaskets in the air piping headers and drops. The leaking gaskets waste energy and may eventually interfere with effective control of aeration basin oxygen levels. Note that replacing these gaskets requires a partial shut-down of the aeration system and may require outside contractor resources to complete this work without jeopardizing continuous

treatment. A complete evaluation of the air piping system should be done at this time as well and consideration given to installing cathodic protection to prevent future deterioration of the air piping.

The blower system was replaced in 2011 with all new blowers and controls. There are no known condition deficiencies that need to be addressed in the aeration blower system. Staff have suggested improvements to the ancillary systems (such as adding a closed-loop water system) to improve operability or reduce costs. These suggestions should be considered on their merits and implemented as appropriate.

6.2.7 Secondary Clarifiers

The mixed liquor from the contact basins flows to one of twelve secondary clarifiers, depending on the wet weather flow rate. Each clarifier is rated for approximately 16.7 MGD. The mixed liquor is allowed to settle in the secondary clarifiers and the clear liquid overflows the effluent weirs. Flow to the on-line clarifiers is divided by clarifier control structures from the flow conduits. Effluent from the clarifiers flows by gravity to the disinfection process. Return sludge settled in the secondary clarifiers is pumped back to the stabilization tank(s).

Six of the secondary clarifiers were commissioned in 2012. Three of the other clarifiers are more than 10 years old at the time this RFP was prepared and the remaining three are original equipment that is now more than 25 years old. Replacement of the oldest three mechanisms is planned for calendar year 2017, and replacement or rehabilitation of the three mechanisms that are currently over ten years old may be required later during this planning period.

6.2.8 Return Activated Sludge (RAS)

Process modeling of the secondary treatment system, including the existing and proposed expanded facilities, was performed to predict treatment performance. Successful treatment up to 200 MGD was modeled with a return activated sludge (RAS) pumping rate of 42 MGD. The existing RAS pumping system has a firm capacity of 42 MGD and design is underway to replace the two smaller pumps to provide 72.0 MGD of firm RAS pumping capacity. This will provide up to 120 percent of the 60 MGD design average flow, considering the impact of dilute wet weather diversions on the annual average flow being treated. While this does not meet the design standards recommended by the Ten States Standards, process modeling and model calibration completed as part of the Post Construction Compliance Monitoring program have demonstrated that this RAS rate is more than adequate to meet the process needs when treating

up to 200 MGD of wet weather flow.

The Variable Frequency Drives (VFDs) are also more than 10 years old and reaching the end of their effective service life. The design for the replacement of all VFDs is complete and the construction should start in summer of 2017.

6.2.9 Waste Activated Sludge (WAS)

The modeled wasting rate for the treatment facilities is 1.52 MGD at peak flow and loads. Firm waste activated sludge (WAS) pumping capacity is 1.73 MGD. WAS is pumped to the Solids Holding Tanks on the DRG WQTC site for aerated storage and then pumped to the MF WQTC for processing. The firm pumping capacity from the Solids Holding Tanks is 2.88 MGD. There are no known condition deficiencies that need to be addressed in the waste sludge pumping system, however automation enhancement for better control and monitoring the solids handling. The sludge line will be evaluated for condition assessment in the next 3 years.

6.2.10 Disinfection

Effluent from the secondary clarifiers is injected with liquid sodium hypochlorite just upstream from the Parshall flume. Sodium hypochlorite dosage is based on flow rate through the plant. After each Chlorine Contact Basin (CCB), effluent passes over a rectangular weir into the effluent trough. Sodium bisulfite for dechlorination is injected on the upstream side of these weirs. After dechlorination, the treated wastewater flows by gravity to the discharge point in the Ohio River.

The disinfection system was expanded and rehabilitated during the construction project that was commissioned in 2012. There are minor deficiencies that need to be addressed in the disinfection system such as hydraulic limitations during high flow at the CCB, original hypo and bisulfite tanks should be considered for replacement. The bisulfite tanks should be installed in a temperature controlled enclosure with adequate access for operations and maintenance activities.

6.3 DRG WQTC CURRENT FLOWS AND LOADS

While the service area is made up of separate sanitary sewers, infiltration and inflow does result in a wet weather impact to plant flows. For that reason, an evaluation of annual average daily flows is required over a significant period. Figure 6-3 presents annual average flows for the time period 1997 through 2016. During the years 1997 – 2010, the flows are from the dry

weather service area only. In 2011, some wet weather flows began to be diverted through the Northern Ditch Interceptor contributing additional flows and increasing overall annual average trends. By the end of 2012 diversion of wet weather flows was routinely practiced during significant rain events.

During wet weather, Integrated Overflow Abatement Plan (IOAP) projects will bring additional portions of the sanitary sewer service area of the Upper Middle Fork basin into the DRG WQTC service area through the Northern Ditch Diversion. The combination of wet weather flow diversions and population growth primarily related to infill of the existing service area may increase the average annual flow contribution from the wet weather service area over the planning period. The impact of wet weather diversions into the DRG WQTC system is addressed in Section 7.

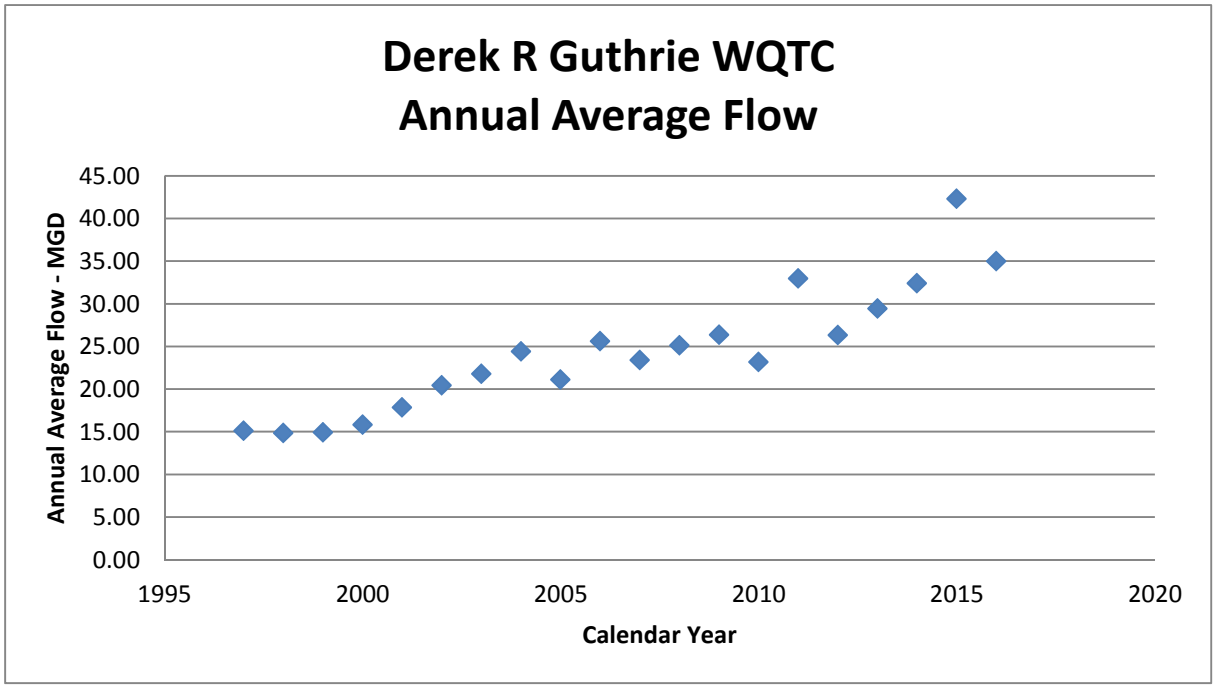


Figure 6-3 DRG WQTC Annual Average Flows

6.4 EXISTING COLLECTION AND CONVEYANCE SYSTEM

The existing collection facilities and small wastewater treatment plants are described in this section.

6.4.1 Collection Lines

All of the planning area's wastewater collection system is operated and maintained by MSD personnel. Occasionally, local contractors or factory service technicians are used for major repairs that are beyond the capability of the MSD staff. Tables 6-3 through 6-5 characterize the existing conveyance system by size, age and pipe material.

Table 6-3 DRG WQTC Conveyance System by Size

Diameter (inches)	Length of Pipe (feet)	%
<8	109,950	2.24%
8	3,605,415	73.53%
10	335,488	6.84%
12	198,534	4.05%
14-27	410,308	8.37%
30-42	120,567	2.46%
48-60	33,238	0.68%
66-100	31,015	0.63%
102-120	58,783	1.20%
Total	4,903,298	100%

Table 6-4 DRG WQTC Conveyance System by Age of Pipes

Age of Pipes	Length of Pipe (feet)	Percentage
Built before 1950	1,226	0.03%
1950-1959	87,087	1.78%
1960-1969	932,231	19.01%
1970-1979	670,366	13.67%
1980-1989	336,560	6.86%
1990-1999	1,142,639	23.30%
2000-2009	1,681,622	34.30%
2010-Present	47,801	0.97%
Unknown	3,766	0.08%
Total	4,903,298	**100%**

Table 6-5 DRG WQTC Conveyance System by Pipe Material

Type of Pipe	Length of Pipe (feet)	Percentage
PVC	2,774,701	56.6%
Vitrified Clay Pipe	1,777,544	36.3%
Reinforced Concrete Pipe (RCP)	280,830	5.7%
Cast Iron Pipe (CAS)	22,873	0.5%
CP	20,588	0.4%
CPP	18,540	0.4%
DIP	7,133	0.1%
Polyethyline Pipe (PE)	624	0.01%
Unknown	465	0.01%
Total	**4,903,298**	**100.00%**

6.4.2 Pump Stations

Inside of the DRG WQTC dry weather service area; there are a total of 61 pump stations. Of these, 36 are MSD pump stations and 25 are private pump stations that deliver flow to MSD's collection system. Pump design information is not available for all of the privately maintained pump stations. The locations of the pump stations are shown on Figure 3-2. Table 6-6 and 6-7 lists the pump stations, with identification number, type, age and capacity. Several of these are scheduled for elimination and are addressed in the Integrated Overflow Abatement Plan (IOAP).

Table 6-6 DRG WQTC Pump Stations

Pumping Station	Station Name	Date of Construction	Lift Station Type	Maximum Pumping Rate (gpd)
MSD1051-PS	Admiral	9/30/1999	Submersible	8,218,080
MSD1143-LS	Bay Harbor Ct	9/24/2003	Submersible	1,676,160
MSD0160-PS	Brandywyne Ct	5/22/1972	Submersible	139,680
MSD0154-PS	Broadfern Drive	2/1/1961	Tank	18,720
MSD1031-PS	Brookbend	2/25/2000	Submersible	203,040
MSD1013-PS	Cinderella	4/4/1995	Submersible	407,520
MSD0048-PS	City Park	NA	Tank	612,000
MSD0130-PS	Cooper Chapel Road	3/1/1963	UGS	626,400
MSD0054-PS	East Rockford Lane	NA	Tank	672,480
MSD1048-PS	Edsel	7/28/1999	Submersible	871,200
MSD1008-PS	Francell	9/15/1978	Tank	198,720
MSD0198-PS	Garden Trace	1/22/1993	Submersible	92,160
MSD0112-PS	Hasbrook	10/24/1995	Submersible	1,242,720
MSD1041-PS	Hillview	6/25/1998	Submersible	113,760
MSD1003-PS	Industrial	8/25/1992	Submersible	1,753,920
MSD0195-PS	Jefferson Hill	11/10/1993	Submersible	41,760
MSD0101-PS	Lantana Drive #1	9/30/1999	Submersible	109,440
MSD1010-PS	Lea Ann Way	5/10/1995	Building	20,808,000
MSD1019-PS	Leven	3/29/1996	Submersible	237,600
MSD0103-PS	Mcneely Lake	7/24/1970	Tank	263,520
MSD0052-PS	Mill Creek	2/27/1962	Submersible	446,400
MSD1147-PS	Mount Washington Road	4/6/2005	Submersible	829,440
MSD1020-PS	Mud Lane	6/5/1999	Submersible	470,880
MSD0164-LS	Oreland Mill	5/31/1972	Tank	688,320
MSD0143-PS	Park Ridge Woods	5/29/1990	Submersible	164,160
MSD1047-LS	Parkwood	11/10/1975	Submersible	110,880
MSD0137-LS	Piccadilly	11/19/1988	Submersible	226,080

Table 6-6 DRG WQTC Service Area Pump Stations (Continued)

Pumping Station	Station Name	Date of Construction	Lift Station Type	Maximum Pumping Rate (gpd)
MSD0049-PS	Rosa Terrace	2/28/1962	Tank	302,400
MSD0053-PS	Sanders Lane	2/20/1962	Submersible	151,200
MSD0055-LS	Shively	11/4/1977	Building	17,629,920
MSD0142-PS	Six Mile Lane	3/26/1990	Submersible	41,760
MSD0120-PS	Sunlight	3/23/1988	Submersible	587,520
MSD0140-PS	Tree Line	11/21/1989	Submersible	715,680
MSD0111-LS	Valley Village	8/2/1955	Submersible	612,000
MSD0072-LS	Villa Ana	7/5/1956	UGS	1,010,880
MSD1182-PS	Woodland-Barber	1/13/2005	Submersible	322,560

Table 6-7 DRG WQTC Service Area Private Pump Stations

Pumping Station	Station Name	Date of Construction	Lift Station Type	Maximum Pumping Rate (gpd)
88377-LS	All Tune & Lube	2/24/1997	Submersible	Unavailable
42167-PS	Autumn Lake Pump Station	5/18/1995	Submersible	190,080
81844-PS	Board of Education	5/31/1962	Submersible	Unavailable
33883-PS	Cane Run Rd	10/21/1997	Submersible	138,240
55347-PS	Chatamwood Dr	9/1/1973	Submersible	Unavailable
107667-LS	Cherry Blossom	2/18/1987	Submersible	446,400
81642-PS	Chosen Childrens Home	8/31/1987	Submersible	244,800
32626-LS	Dairymart Store	4/1/1996	Submersible	Unavailable
107691-LS	Elderberry Ridge	12/7/1990	Submersible	Unavailable
63573-PS	Fegenbush	6/20/1996	UGS	Unavailable
112832-PS	Global Port	3/12/2007	Submersible	42,336
55303-PS	Harrison FM	7/1/2013	Submersible	Unavailable
55300-PS	Harrison FM	7/1/2013	Submersible	Unavailable
55301-PS	Harrison FM	7/1/2013	Submersible	Unavailable

Pumping Station	Station Name	Date of Construction	Lift Station Type	Maximum Pumping Rate (gpd)
55302-PS	Harrison FM	7/1/2013	Submersible	Unavailable
92658-PS	Keys Ferry Rd	8/27/2001	Tank	72,000
98652-PS	Midland	9/30/1999	Submersible	Unavailable
34858-PS	Okolona Church	1/19/1995	Submersible	Unavailable
82257-PS	Outer Loop	7/2/1980	Submersible	43,200
50911A-PS	Private Industrial	1/1/1993	Submersible	Unavailable
50911B-PS	Private Industrial	1/1/1993	Submersible	Unavailable
64062-PS	Quail Chase Golf Course		UGS	24,480
35686-LS	Roberta Park MHP	12/14/1963	Submersible	Unavailable
104336B-LS	Shacklette Elementary	10/1/2001	Submersible	Unavailable
58127-PS	Walgreens	3/9/2009	Tank	Unavailable

6.4.3 Existing Biosolids Disposal Method

Sludge generated by MSD WQTCs within the DRG planning area is stored in sludge holding tanks for the short-term and then are pumped from DRG WQTC to the Morris Forman WQTC for further processing and disposal. The ultimate disposal for all sludge generated by MSD WQTCs is a Class A biosolids fertilizer. The biosolids fertilizer product is commercially marketed.

6.4.4 Existing Operation, Maintenance and Compliance Issues

The DRG WQTC has an excellent record of performance, with no KPDES effluent concentration parameter violations in the past 5 years, despite the plant undergoing major construction during that entire time period. The flow diversions from the wet weather service area have increased the flows being treated during wet weather. During periods of extended wet weather the average plant flow can exceed 30 MGD for days or weeks at a time. Since the current KPDES mass loading permit limits are calculated based on an annual average flow of 30 MGD mass loading violations have occurred even though the concentration limits have been met. MSD is currently preparing a request for an updated waste load allocation that can reflect the higher anticipated wet weather flows in the calculation of new mass loading limits for the plant.

The numerous capital projects in recent years have updated, rehabilitated or added process equipment throughout the plant so that there are no known issues with operation, maintenance or compliance with all permitted limits. Under the Capacity, Management, Operations and Maintenance (CMOM) program, MSD continually monitors, inspects and insures facilities are operating at or above intended levels of service.

Extraneous water entering the sewer system through infiltration from groundwater sources and through inflow from direct connections reduces the available capacity of sewer systems and treatment facilities. Sewer system evaluation study (SSES) was performed between 2008 and 2018 to establish the baseline condition of the sewer infrastructure for all of MSD sewer and manhole assets. These studies identify I/I locations such as illicitly connected foundation drains, sump pumps, defective cleanouts, and improperly sealed manhole rings and frames and recommendations for remedy of these defects. Rehabilitation projects are developed from the data received from the recurring evaluations to help reduce I/I and increase the capacity of the existing infrastructure.

SECTION 7: FORECASTS OF FLOWS AND WASTE LOADS

7.1 CURRENT AND PROJECTED COMMERCIAL, INDUSTRIAL AND RESIDENTIAL GROWTH

The criteria to determine land suitable for future development was constructed based on the process used to develop this information for the recently approved Floyds Fork Action Plan Update (FFAPU). The FFAPU criteria were determined after reviewing previous action plans and available information through LOJIC. For consistency, the criteria will be employed in DRG WQTC RFPU. Criteria for future development are listed in Table 7-1.

Once the developable acreage was established, the following assumptions were made:

- There is a density of three houses per developable acre for land zoned as residential.
- Vacant land build out is complete in 40 years.
- Areas with slopes greater than 20 percent will not be developed

Flow calculation based on an average daily flow of 400 gpd per single family equivalent for conveyance projections and 290 gpd per single family equivalent for treatment. The same flow factors were utilized in the approved FFAPU 2010.

Table 7-1 Criteria for Suitable Land for Development

Criteria	DRG WQTC Service Area
1. Parcel is larger than 7 acres	X
2. Location is outside of the 100 year flood plain	X
3. Slope is less than 20 percent	X
Parcels exclude:	
Transportation Corridors	X
Parks	X
Golf Courses	X
Conservation Areas	X
Wetlands	X
Cemeteries	X
Established or Planned Subdivisions	X

An Infoworks ICM model that was calibrated to in-system flow monitors was used to model the system response to wet weather and the magnitude of flows that would be received at the plant in both wet weather and dry weather. A full year simulation using data from 2001 was used to determine expected flows. The year of 2001 was statistically considered an average year for rainfall in development of the IOAP. Peak flows at the plant as well as average daily flow were determined using this model. For future development, areas and populations for

each zone were added to new subcatchments within the model. These subcatchments and their future populations were assigned a diurnal pattern similar to the patterns of other neighboring subcatchments with a flow of 290 MGD per home and 3 homes per acre. During the annual simulation, additional wet weather flow from subcatchments would enter the sewer. The flow is based on new development subcatchment parameters that allow a small percentage of the rainfall to enter the system in order to peak flows during rain events. This allowed the model to replicate rainfall responses from new development areas. The subcatchment parameters were developed based on new development areas that have been monitored previously.

When flows dictate and downstream capacity is available, the Upper Middle Fork basin will be diverted into the DRG WQTC service area through the Northern Ditch Diversion. The combination of wet weather flow diversions and population growth primarily related to infill of the existing service area will increase the average annual flow contribution from the wet weather service area over the planning period. In 2012, the wet weather flow diversions began to add to the annual average flow because of the diversion during wet weather. By 2037, the wet weather flow diversions are projected to add 25.3 MGD to the annual average flow, bringing the total annual average flow to 59.9 MGD (with 34.6 MGD coming from the dry weather service area). Although Average Annual Flow is highly dependent on rainfall in any given year, the current Average Annual Flow for 2016 is 34.96 MGD.

The flow projections for the DRG WQTC service area are summarized in Table 7-2, 7-3, and 7-4.

Table 7-2 Projected DRGWQTC Flow Increases (GPD) by Zone

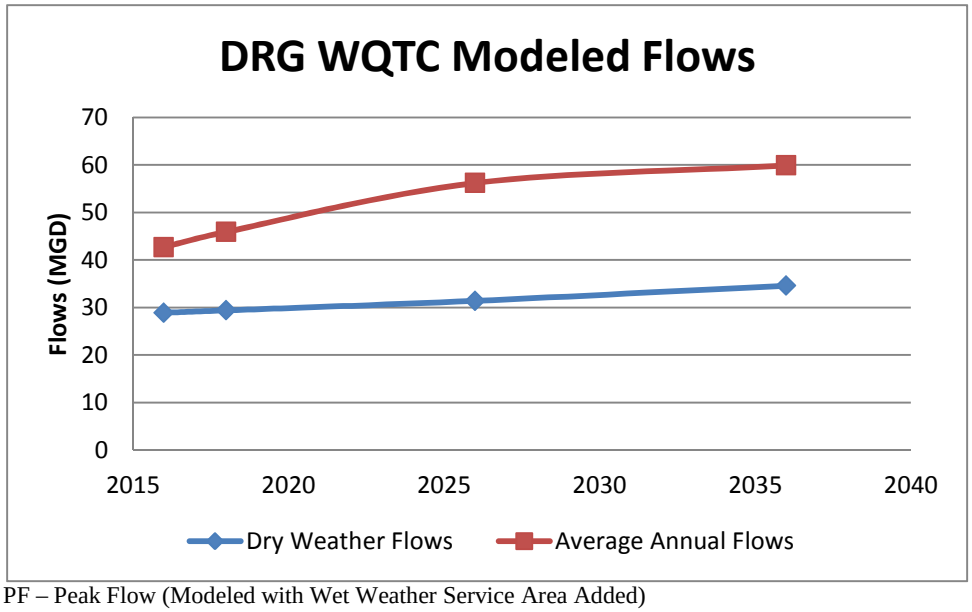
	2 Year Dry Weather Flow	5 Year Dry Weather Flow	10 Year Dry Weather Flow	20 Year Dry Weather Flow	Ultimate Dry Weather Flow
Zone A	98,432	246,080	246,080	246,080	246,080
Zone B	129,749	324,373	605,161	1,815,483	4,560,500
Zone C	2,096	5,240	456,937	1,370,811	3,203,800
Zone D	656	1,640	44,766	134,297	315,000
Zone E	17,990	44,976	363,932	1,091,796	2,592,500
Zone F	4,560	11,400	4,629	13,886	43,800
Zone G	640	1,600	127,286	381,857	892,600
Total	**254,124**	**635,309**	**1,848,790**	**5,054,210**	**11,854,280**

Table 7-3 Modeled Flow Increases to the DRGWQTC

Year	DWF (MGD)	AAF (MGD)	PF (MGD)
2017	28.9	42.7	251.5
2019	29.4	45.9	255.4
2027	31.4	56.2	270.1
2037	34.6	59.9	284.5

DWF - Dry Weather Flow

AAF - Average Annual Flow



PF – Peak Flow (Modeled with Wet Weather Service Area Added)

Figure 7-1 DRG WQTC Modeled Flows

7.2 PROPOSED DESIGN CAPACITY OF THE DEREK R. GUTHRIE WQTC

The design capacity of the DRG WQTC to accommodate growth as described in this RFPU is predicated on the wet weather expansion completed under the IOAP. The flows and loadings used to determine the sizing of process units under that project are being used to calculate the capacity for treatment of ADF conditions. These values are shown in Table 6-2 in Section 6 with the current capacity of 30 MGD.

7.3 WASTE LOAD ALLOCATION (WLA)

A letter requesting an updated WLA was sent to KDOW on November 30, 2016 based on an anticipated expansion of plant capacity to 60 MGD. KDOW responded on December 20, 2016 to the request. See letter below as Figure 7-2.

The effluent discharge for the DRG will remain at mile point 622.4 of the Ohio River. No negative impact is anticipated to water quality in the stream.

Figure 7-2 DRG WQTC WLA December 20, 2016

MATTHEW G. BEVIN
GOVERNOR

CHARLES G. SNAVELY
SECRETARY

ENERGY AND ENVIRONMENT CABINET
DEPARTMENT FOR ENVIRONMENTAL PROTECTION

AARON B. KEATLEY
COMMISSIONER

300 SOWER BOULEVARD
FRANKFORT, KENTUCKY 40601

December 20, 2016

Daymond M. Talley
Laboratory Manager
Louisville and Jefferson County
Metropolitan Sewer District
700 West Liberty Street
Louisville, Kentucky 40203-1911

Re: Waste Load Allocation Re-Rate Request
Derek R. Guthrie Water Quality Treatment Center
KPDES No.: KY0078956
Jefferson County, Kentucky

Dear Mr. Talley:

This is in response to your November 30, 2016 email (attached), requesting a waste load allocation (WLA) for a re-rated Derek Guthrie Water Quality Treatment Center (WQTC). Per your correspondence, a re-rate from 30 MGD to 60 MGD is proposed. Discharge is to remain near 85°54'04.85" west longitude and 38°05'19.13" north latitude, at National Hydrography Dataset (NHD) River Mile (RM) 622.4 of the Ohio River, segment number 08215.

The division notes that the Ohio River (NHD RM 674.8 to 612.4) is included on the 2014 303(d) List of impaired waters. The impaired uses are: warm water aquatic habitat (partial support), primary contact recreation (non-support), and fish consumption (partial support). Pollutants of concern are: dioxin, PCBs, E. coli, and iron. Suspected sources are: source unknown. State and Federal regulations allow new or expanded discharges into impaired waters only if the discharge will improve, or at least not contribute, to existing impairments. Pending additional information regarding pollutant sources, discharge from a re-rated WQTC, in compliance with applicable Kentucky Pollutant Discharge Elimination System (KPDES) permit limitations and requirements, would not be considered a contributor to existing impairments, and could thus be approved.

Therefore, considering the above information, effluent limitations applicable to the subject re-rated facility are stated below.

KentuckyUnbridledSpirit.com

Kentucky UNBRIDLED SPIRIT

An Equal Opportunity Employer M/F/D

Design Capacity = 60 MGD / Discharge to NHD RM 622.4 of the Ohio River

Parameter	May 1 - October 31	November 1 - April 30
BOD_5	30 mg/l	30 mg/l
Total Suspended Solids	30 mg/l	30 mg/l
Ammonia Nitrogen	20 mg/l	20 mg/l
Dissolved Oxygen	2 mg/l	2 mg/l
Total Phosphorus	Monitor, mg/l	Monitor, mg/l
Total Nitrogen	Monitor, mg/l	Monitor, mg/l
Total Residual Chlorine	0.019 mg/l	0.019 mg/l
Toxicity	1.0 TUa	1.0 TUa

Reliability Classification = Grade C

In addition to the above requirements, the monthly average and weekly maximum values of E. coli shall be at or below 130 colonies per 100 milliliters or 240 colonies per 100 milliliters, respectively, the year around. If a form of chlorine is proposed to disinfect the wastewater, then de-chlorination will likely be needed to achieve the chlorine residual effluent concentration. Additional effluent limitations and water quality standards are contained in 401 KAR Chapter 5 and 401 KAR Chapter 10.

These preliminary design effluent limitations are valid for one (1) year from the date of this letter, and are subject to change as a result of additional information which may be presented during the public notice phase of the Kentucky Pollutant Discharge Elimination System (KPDES) permitting process. As such, this letter does not convey any authorization or approval to proceed with the construction or operation of the proposed wastewater treatment plant. Construction and KPDES permit applications must be submitted to request such authorization or approval. Nor does this letter ensure issuance of either permit. During the review processes of these permits the Division of Water will further evaluate the viability of the project.

Should you have any questions regarding this letter, please contact me at (502) 782-7066 or E-mail at Courtney.Seitz@ky.gov.

Sincerely,

Courtney Seitz

Courtney Seitz, WLA Coordinator
Wet Weather Section
Surface Water Permits Branch
Division of Water

CS
c: Russell Neal, Water Infrastructure Branch
Compliance and Technical Assistance
Branch, Louisville Section
Division of Water Files

SECTION 8: EVALUATION OF ALTERNATIVES

8.1 NO ACTION ALTERNATIVE

Flows from the DRG Water Quality Treatment Center (WQTC) dry weather service area are projected to grow by approximately 5.7 MGD during the planning period of 2016 – 2036. As described in Section 7, this growth is a combination of infill in the existing service area, and existing onsite treatment being eliminated by new sewer service.

In the wet weather service area, flows will increase primarily as a result of Integrated Overflow Abatement Plan (IOAP) projects bringing additional portions of the sanitary sewer service area of the Upper Middle Fork basin into the DRG WQTC service area through the Northern Ditch Diversion. The combination of wet weather flow diversions and population growth primarily related to infill of the existing service area will increase the average annual flow contribution from the wet weather service area over the planning period. In 2012, the wet weather flow diversions began to add to the annual average flow because of the diversion during wet weather. By 2036, the wet weather flow diversions are projected to bring the total annual average flow to 59.9 MGD (with 34.6 MGD coming from the dry weather service area).

To accommodate the projected growth, modifications to the collection system will be required. The "No Action" alternative is not viable relative to the collection system. If action is not taken, growth in the service area will not be possible. Collection system projects divided into development zones are shown in Figure 8-1.

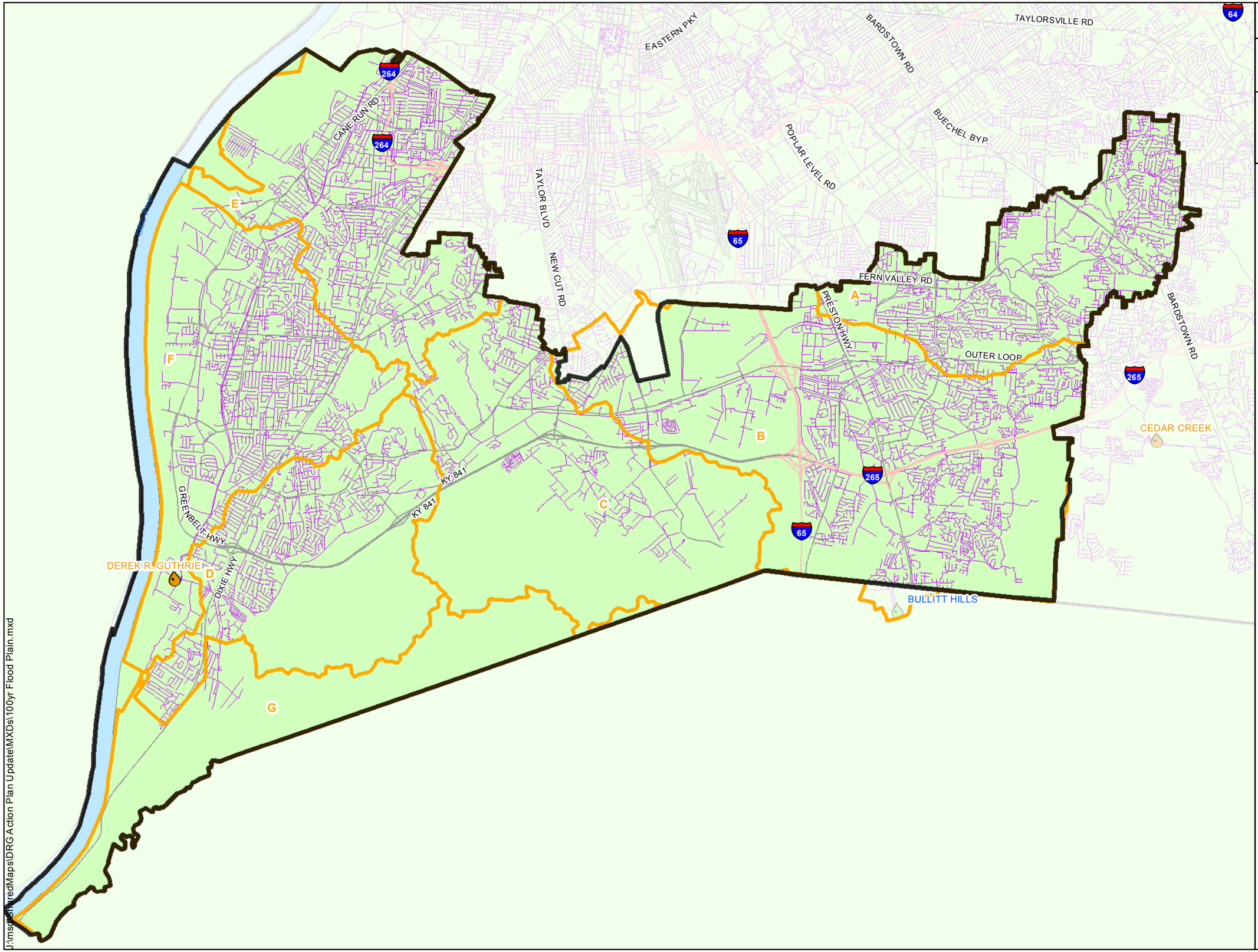
The current treatment capacity at the DRG WQTC is adequate to accommodate the projected growth within the existing facilities. While annual average flows are projected to increase by 85%, the peak flow taken through treatment will remain fixed at a maximum of 200 MGD. The IOAP projects, including the flow equalization basin at the DRG WQTC were sized to control peak wet weather flows at the plant to 200 MGD or less throughout the planning period.

In the expansion completed in 2012, the treatment units were sized based on the "worst case" of dry weather loads, annual average loads including the impact of the wet weather diversions, or peak loads during wet weather. The wet weather peak loads controlled the unit process sizing in almost every case. The one exception to this is return activated sludge (RAS) pumping. The current RAS firm pumping capacity of 42 MGD was deemed adequate for the rated dry weather flow of 30 MGD. The KDOW design standards, however, require contact stabilization activated sludge plants to have RAS pumping capacity up to 150% of design average flow. A design is underway to replace both of the 8 MGD RAS pumps with 23 MGD RAS pumps will give a firm pumping capacity of 72.0 MGD. While this does not meet Ten

Figure: 8-1

DEREK R. GUTHRIE REGIONAL FACILITES PLAN
LOUISVILLE AND JEFFERSON COUNTY
METROPOLITAN SEWER DISTRICT

COLLECTION SYSTEM



- MSD Regional Treatment Plant
- MSD Treatment Plant
- Private Treatment Plant
- Streams
- Expressway
- Major Roads
- Jefferson County Boundary
- Pond Creek Watershed
- Mill Creek Watershed
- Planning Area Boundary
- DRG Zones
- Sewers

N
W E
S

0 0.75 1.5 Miles

1 inch equals 1.5 miles

Map Prepared by MSD GIS Services and Records

Map Created: 7-APR-2017

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States Standards for an average annual flow of 60 MGD, detailed process modeling confirmed by post construction model calibration has demonstrated that this RAS capacity is adequate for the conditions expected when wet weather causes diversion from the wet weather service area. Since future dry weather flows are projected to only reach 34.6 MGD by the end of the planning period, RAS pumping capacity will be adequate for the duration of the planning period.

Table 8-1 compares the projected loads during the planning period to the design loads of the existing facilities. This demonstrates that the wet weather peak loads control capacity requirements. Peak BOD and NH3 loads are within 0.5% of the plant capacity documented in the Construction Permit Application dated July 15, 2009. This is well within the accuracy limits of both the load projections and the capacity determination. Based on the load comparisons in Table 8-1, the existing capacity of the plant is adequate to meet future loading conditions. As noted previously, MSD has a project underway to increase RAS pumping.

Table 8-1 Projected 2036 DRG WQTC Load vs. Treatment Design Capacity

Flow Condition	Flow MGD	BOD Lbs/day	TSS Lbs/day	NH3 Lbs/day	O2 Demand Lbs/day
Dry Weather Annual Average	34.6	59,501	74,376	4,212	84,828
Total Service Area Annual Average	59.9	90,611	107,847	6,796	130,932
Peak Wet Weather Flow to Treatment	200.0	145,116	176,808	8,340	159,628[(2)]
Existing WQTC Capacity[(1)]	**220.5**	**144,400**	**177,300**	**8,326**	**178,587**

[(1)]Capacity values per Construction Permit Application dated July 15, 2009
[(2)]Assumes no nitrification occurs during peak wet weather flows

8.1.1 Unit Process Description

A detailed project description of the existing plant unit processes is presented in Section 6.2. With the exception of increased RAS pumping, the previous description accurately describes the unit processes anticipated throughout the planning period, and modifications recommended to improve operations and maintenance of those facilities.

8.2 OPTIMIZATION OF EXISTING FACILITIES

8.2.1 WQTC Facility Optimization

As noted in the previous section, the existing WQTC facilities have adequate capacity to meet the maximum loading conditions anticipated during the planning period. Other than the current project to expand the RAS pumping, no other major WQTC modifications are required for capacity. Modifications to the piping between the grit basins and aeration basins, adding isolation gates in the Aeration Basins No. 1-4 influent channels and upsizing or providing parallel relief piping for the discharge from the expanded RAS pumping system are also recommended, but not required to achieve required capacity. It is expected that routine renewal and replacement of facilities will occur consistent with good asset management practice.

8.3 REGIONALIZATION

8.3.1 Regionalization Through Real Time Control Operation of Collection System

As described in Section 7, the DRG WQTC plays a key role in the system-wide flow management strategy of the IOAP. During dry weather, the service area boundaries are similar to current boundaries, except for expansion and infill areas as described in Section 7. During wet weather, however, a significant portion of the MF WQTC service area that is served by separate sanitary sewers will be routed away from the Southeast Diversion Structure and the Northern Ditch Pump Station, and sent to the DRG WQTC instead. Figure 8-2 illustrates a schematic of this flow routing and control facilities.

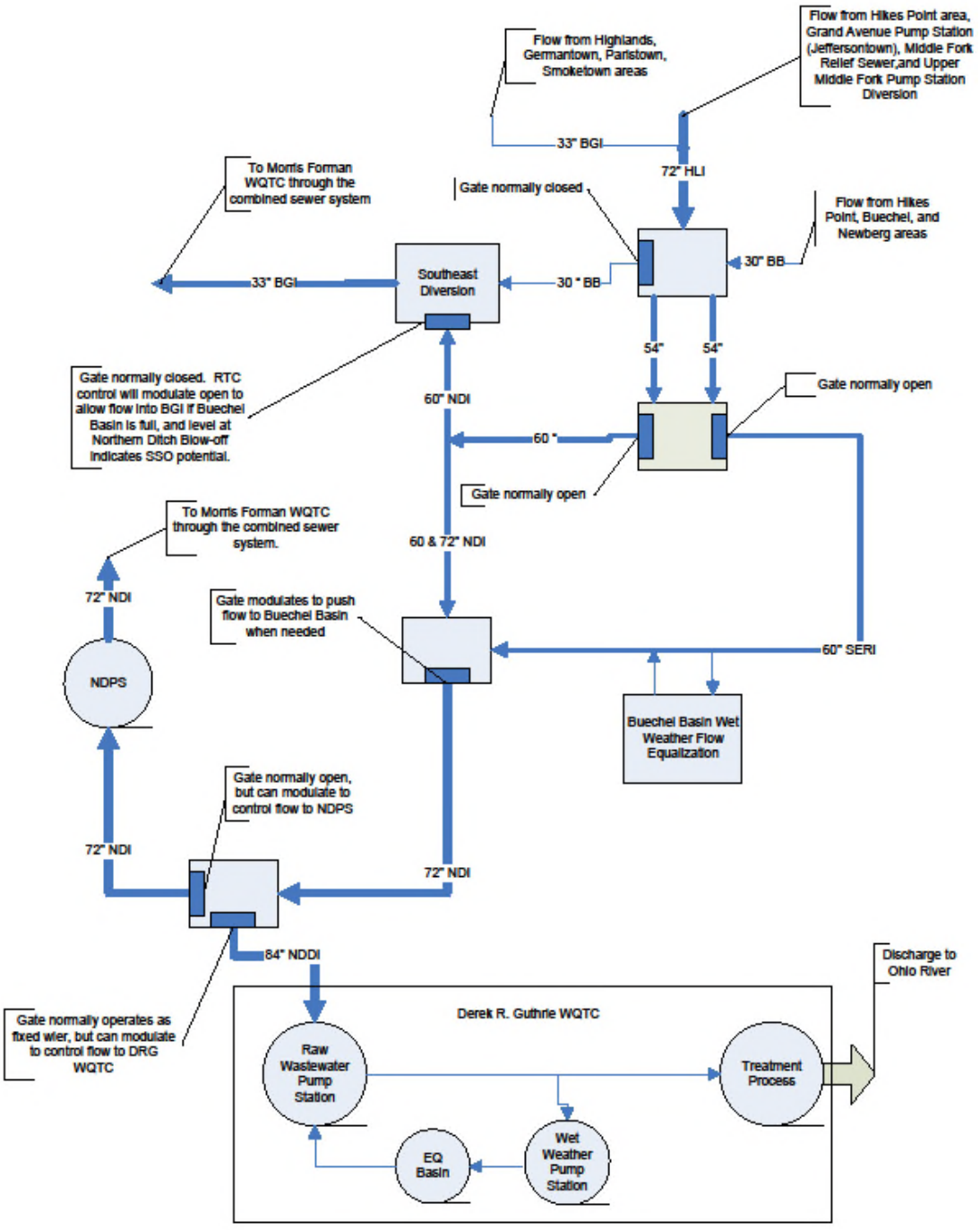


Figure 8-2 DRG Diversion Flow Schematic

Control of this flow routing strategy will be accomplished primarily by the Real Time Control (RTC) system that MSD has used since 2006 to optimize use of its conveyance and treatment system. The general regional control concept is as follows:

- Dry weather – DRG WQTC receives flow from dry weather service area only. MF WQTC receives flow from the Hikes Lane Interceptor (HLI), Buechel Branch (BB), and Beargrass Interceptor (BGI) either through Southeast Diversion or Northern Ditch Pump Station.
- Wet weather – HLI, BB, and BGI are routed around the Southeast Diversion to the Northern Ditch Interceptor (NDI). BB may begin to equalize flow in the NDI when water level indicates the potential for surcharging or risk of SSOs. Northern Ditch Diversion structure maximizes flow from NDI to the Northern Ditch Diversion Interceptor and then to the DRG WQTC.
- For wet weather flows up to 200 MGD, the Raw Wastewater Pump Station delivers flow to the treatment process. As flows exceed 200 MGD, the Wet Weather Pump Station begins to send flow to the Short-Term Detention Basin and the Equalization Basin for storage. If flows continue to exceed 200 MGD and the Equalization Basin approaches being full, control gates on the NDI will limit flows passing to the Northern Ditch Diversion by pushing peak flows to the Buechel Basin.
- If wet weather flows in excess of 200 MGD continue and both the Equalization Basin and the Buechel Basin are full, the RTC system will start sending more flow to the Northern Ditch Pump Station, sending the excess flow to the MF WQTC. When all these flow paths are at maximum capacity, a gate on the Southeast Diversion Structure will open, allowing back-flow from the Southeast Interceptor Relief to go to the MF WQTC through the BGI.

This entire control strategy will be optimized based on flow and level measurements, rainfall measurements and predictions, and control logic that optimizes use of MSDs conveyance and treatment facilities in both the DRG WQTC and MF WQTC service areas.

8.4 RECOMMENDED TREATMENT ALTERNATIVE

No additional alternatives were explored due to the work completed as part of the IOAP Wet Weather expansion at the DRG WQTC. Since the work is already complete, no cost analysis was prepared.

The recommended alternative for the DRG WQTC is to continue to use the existing facilities upgraded in a series of construction projects completed in 2012. To achieve this rated capacity

of 60 MGD, both of the 8 MGD RAS pumps are being replaced with 23 MGD pumps. The RAS building is shown in figure 8-4 as part of the plant operations schematic. Upgrading the pumps will require interior piping and electrical modifications. The total cost for this work is estimated at $2,000,000. These improvements will allow for the dry weather flow capacity to be increased to 60 MGD.

As noted in Section 6.2.5 and Section 6.2.6, two of the 42-inch lines between the grit basins and the aeration basins should have gates added at each end to allow them to be isolated from the flow stream. Gates should also be added to the aeration basin influent channel in place of the existing stop logs, to facilitate channel cleaning and maintenance. These improvements are estimated to cost $600,000 (all costs are indexed to 2012 dollars). While these improvements do not affect the rated capacity of the facility, they are recommended to allow for ease of maintenance.

In addition to the improvements that deal with capacity, the following items are recommended for evaluation and rebuild or replacement during the planning period:

- HVAC systems in the Wet Weather Pump Station, Screening Building, and Grit Building
- Wet Weather Screen Building screens
- 60-inch air supply line from the Blower Building to the Aeration Basins (if indicated by a comprehensive condition assessment)
- Aeration Basin air distribution piping and drops, including leaking gaskets and other corrective measures
- Elevators in the Wet Weather Pump Station and Wet Weather Screen Building
- Bio-Rem odor control unit rehabilitation, including the bed and the W-2 water system
- West County Force Main Condition assessment

These rebuild/replacement items do not affect the rated capacity of the facility, but are recommended for continued reliable operation. Costs for these will be estimated during the planning of these projects. Other non-process items of concern noted in Chapter 6 should also be addressed through corrective maintenance actions.

8.5 COLLECTION SYSTEM ALTERNATIVES

Conveyance alternatives for future flow were evaluated for the DRG WQTC dry weather service area by zone. Each zone was analyzed to determine areas that would require a 12-inch diameter or larger interceptor based on future peak flow from anticipated future development. The cost analysis for the collection system was based on a costing tool that MSD has used in

the planning and completion of its IOAP. This planning tool allows MSD to estimate capital and present worth costs for pipes with consideration to the pipe depth, pipe size and surface conditions, as well as pump stations, force mains and sewer storage systems. A summary of the projects and project alternatives, their zones and the estimated capital costs is in the Table 8-2 below and shown on a map on Figure 8-3. The chosen alternatives are highlighted in gray. Beyond the new interceptors and pump stations to capture future development flow, projects that were developed to eliminate SSOs are also outlined in Table 8-3. The SSO abatement project alternatives were evaluated as a part of MSD's IOAP, using a benefit-cost analysis. Table 8-4 shows assessment projects for areas of expanded sewer service. The selected alternatives are shown on Figure 8-3.

Table 8-2 Future Development Project Alternatives

Project	Zone	Capital Cost	Project Start
Bear Camp Creek Interceptor	C	$4,473,000	3-10 years
Jefferson Hill Road Interceptor	C	$4,017,000	3-10 years
Bear Camp Creek and Jefferson Hill Road Combination Interceptor	C	$11,452,000	
Crane Run Interceptor and Pump Station	D	$4,338,000	
Briar Creek Interceptor and Pump Station	G	$11,610,000	
Crane Creek to Briar Creek Combination Project	D and G	$14,927,000	11-20 years
Cane Run Creek Interceptor	E	$727,000	11-20 years
Riverside Gardens Pump Station Expansion	E	$1,891,000	11-20 years
Greenbelt Highway Interceptor	F	$2,149,000	11-20 years
Bethany Lane Pump Station	F	$2,734,000	
The projects highlighted in gray are the selected alternatives discussed in Section 8.6.			

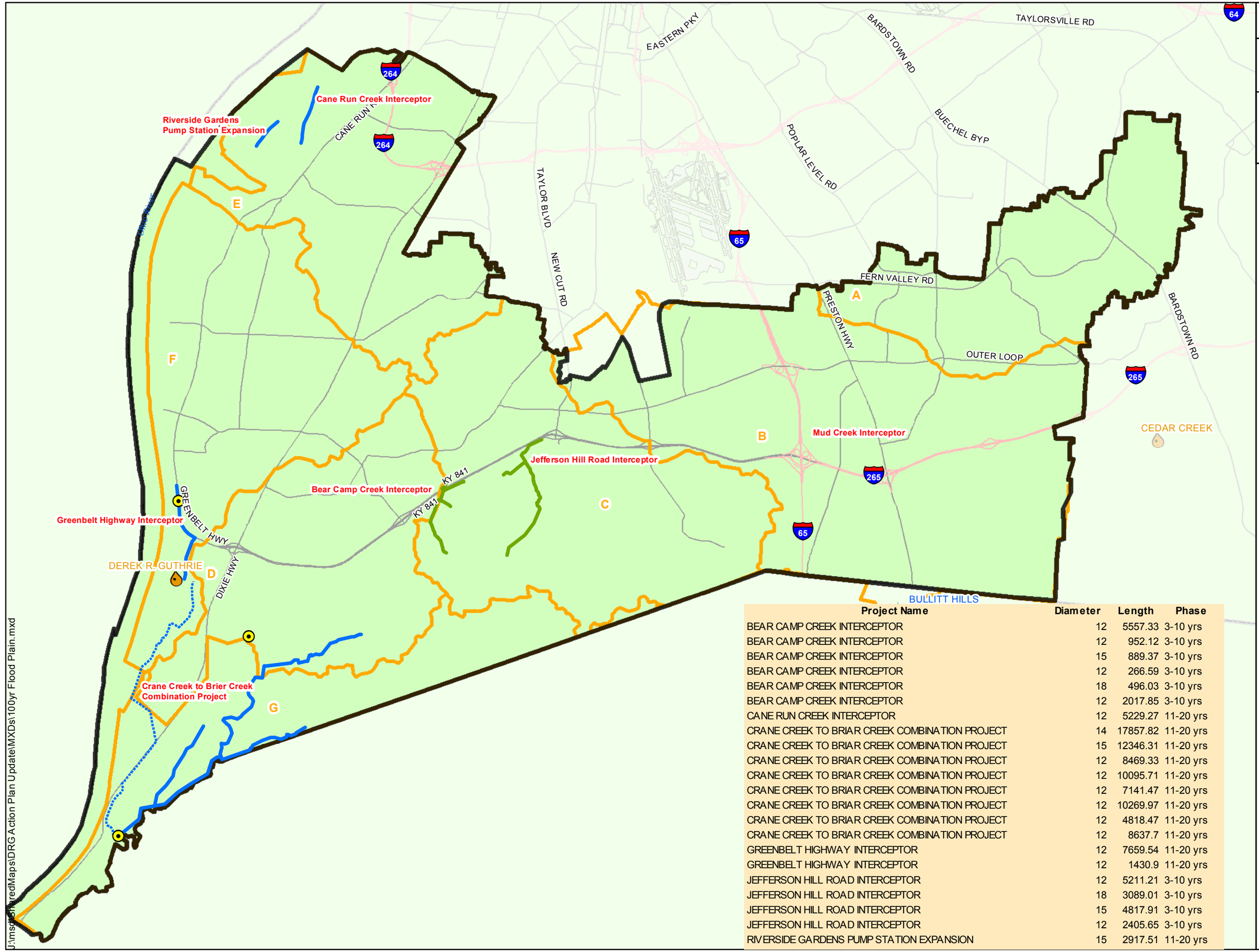
Table 8-3 IOAP Projects

Project	**Zone**	**Capital Cost**	**Project Start**
Cinderella PS Elimination	B	$1,427,000	3-10 years
Leven PS Elimination	B	$4,017,000	3-10 years

Figure: 8-3

DEREK R. GUTHRIE REGIONAL FACILITES PLAN
LOUISVILLE AND JEFFERSON COUNTY
METROPOLITAN SEWER DISTRICT

PROPOSED SEWER/PUMP STATION



Project Name	Diameter	Length	Phase
BEAR CAMP CREEK INTERCEPTOR	12	5557.33	3-10 yrs
BEAR CAMP CREEK INTERCEPTOR	12	952.12	3-10 yrs
BEAR CAMP CREEK INTERCEPTOR	15	889.37	3-10 yrs
BEAR CAMP CREEK INTERCEPTOR	12	266.59	3-10 yrs
BEAR CAMP CREEK INTERCEPTOR	18	496.03	3-10 yrs
BEAR CAMP CREEK INTERCEPTOR	12	2017.85	3-10 yrs
CANE RUN CREEK INTERCEPTOR	12	5229.27	11-20 yrs
CRANE CREEK TO BRIAR CREEK COMBINATION PROJECT	14	17857.82	11-20 yrs
CRANE CREEK TO BRIAR CREEK COMBINATION PROJECT	15	12346.31	11-20 yrs
CRANE CREEK TO BRIAR CREEK COMBINATION PROJECT	12	8469.33	11-20 yrs
CRANE CREEK TO BRIAR CREEK COMBINATION PROJECT	12	10095.71	11-20 yrs
CRANE CREEK TO BRIAR CREEK COMBINATION PROJECT	12	7141.47	11-20 yrs
CRANE CREEK TO BRIAR CREEK COMBINATION PROJECT	12	10269.97	11-20 yrs
CRANE CREEK TO BRIAR CREEK COMBINATION PROJECT	12	4818.47	11-20 yrs
CRANE CREEK TO BRIAR CREEK COMBINATION PROJECT	12	8637.7	11-20 yrs
GREENBELT HIGHWAY INTERCEPTOR	12	7659.54	11-20 yrs
GREENBELT HIGHWAY INTERCEPTOR	12	1430.9	11-20 yrs
JEFFERSON HILL ROAD INTERCEPTOR	12	5211.21	3-10 yrs
JEFFERSON HILL ROAD INTERCEPTOR	18	3089.01	3-10 yrs
JEFFERSON HILL ROAD INTERCEPTOR	15	4817.91	3-10 yrs
JEFFERSON HILL ROAD INTERCEPTOR	12	2405.65	3-10 yrs
RIVERSIDE GARDENS PUMP STATION EXPANSION	15	2917.51	11-20 yrs

- MSD Regional Treatment Plant
- MSD Treatment Plant
- Private Treatment Plant
- Streams
- Expressway
- Major Roads
- Jefferson County Boundary
- Pond Creek Watershed
- Mill Creek Watershed
- New Pump Stations
- Forcemain, 11-20 yrs
- Interceptor, 11-20 yrs
- Interceptor, 3-10 yrs
- DRG Zones

N
W E
S

0 0.75 1.5 Miles

1 inch equals 1.5 miles

Map Prepared by MSD GIS Services and Records

Map Created: 7-APR-2017

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Table 8-4 Assessment Projects

Project	Zone	Capital Cost	Project Start
Briscoe Lane Sanitary Sewer	A	$4,271,000	11-20 years
Fegenbush Ln Sanitary Sewer	A	$609,000	11-20 years
Chenoweth Run Sanitary Sewer	A	$331,000	11-20 years
Industrial Park Sanitary Sewer	A	$760,000	11-20 years
Mud Ln. Sanitary Sewer Assessment	B	$1,121,000	11-20 years
Knopp Melton Phase 2 Sanitary	B	$822,000	11-20 years
National Turnpike Sanitary Sewer	B	$1,410,000	11-20 years
Jefferson Hill Pump Station	C	$1,725,000	11-20 years
Blevin Gap Road East Sanitary	C	$1,763,000	11-20 years
Blevin Gap Road West Sanitary	C	$1,763,500	11-20 years
St. Anthony Church Road Sanitary	C	$1,410,000	11-20 years
Mooreman Road Sanitary Sewer and Drainage	D	$290,000	11-20 years

8.6 RECOMMENDED COLLECTION SYSTEM ALTERNATIVES

All areas of development that would need 12” interceptors or greater for future development were evaluated by zone. A description and estimated capital cost are included in this section.

8.6.1 Zone A Development Projects

There are no current development projects in this zone.

8.6.2 Zone B Development Projects

There are no current development projects in this zone.

8.6.3 Zone C Development Projects

Bear Camp Run Interceptor - This proposed project includes an approximately 5,600 ft 12-inch diameter interceptor that runs along Bear Camp Road and picks up potential future development in that area. Two branches to the interceptor pick up flow from the area North and South of Blevins Gap Road. At the intersection of the branches, the interceptor is upsized to an 18-inch diameter line and is tunneled under KY 841 to connect into the 120-inch diameter Pond Creek Interceptor.

Total Estimated Capital Cost: $4,473,000

Jefferson Hill Pump Station Elimination - This proposed project will capture future development flow from the South along Jefferson Hill Rd with an approximately 5,200 ft 12-inch diameter interceptor. The existing Jefferson Hill Pump Station will be eliminated and a new approximately 4,800 ft 15-inch diameter interceptor will convey the flow to the north following the east side of Salt Block Creek. This interceptor will connect with an approximately 2,400 ft 12-inch diameter interceptor that will collect any future flow from the west along Penile Road. At the intersection of these two interceptors, flow will be conveyed North inside an 18-inch diameter line over to the existing 24-inch diameter Bee Lick Interceptor.
Total Estimated Capital Cost: $4,017,000

Alternative Analysis - An alternative to the two projects listed above was evaluated. The alternative includes some of the same interceptors but removes the 18-inch diameter connector line that runs between Penile Road and the Bee Lick Interceptor. The flow runs west along Penile Road inside an approximately 9,700 ft 18-inch diameter interceptor and connects into the Bear Camp Run interceptor. The downstream sections of the Bear Camp Run Interceptor are upsized to a 21-inch diameter interceptor.
Total Estimated Capital Cost: $11,452,000

The alternative capital cost for servicing future development in Zone C by combining the projects is $11,452,000 as opposed to the total capital cost for the two projects as separate entities being $8,490,000. The alternative of running flow from Jefferson Hill Pump Station to an interceptor West along Penile Road to connect with the Bear Camp Run Interceptor is more expensive. There is an additional $2,962,000 in cost for the alternative project.

8.6.4 Zone D and G Development Projects

Crane Run Interceptor and Pump Station - This proposed project includes several interceptors that will capture potential future development. An approximately 10,100 ft 12-inch diameter interceptor in Zone D will run west along Crane Run to collect future development flow and from there a 3,890 ft 12-inch diameter interceptor will run north to a proposed pump station near the confluence of Crane Run and Pond Creek. An approximately

2,700 ft 8-inch diameter force main will convey flow north into the existing 120-inch diameter Pond Creek Interceptor.
Total Estimated Capital Cost: $4,338,000

Briar Creek Interceptor - This proposed project is to capture future development flow in Southwestern Jefferson County. An approximately 8,600 ft 12-inch diameter interceptor will collect future development flow from areas surrounding Pauley's Gap Road and Pendleton Road. This interceptor will intersect with another proposed interceptor that is approximately 7,100 ft and runs south along the east side of Pond Creek. At the confluence of the two interceptors, an approximately 12,300 ft 15-inch diameter interceptor will run under Pond Creek and west along the north side of Pond Creek. Another 12-inch diameter interceptor connects into this 15-inch diameter interceptor and it flows along a tributary to Pond Creek to collect future development flow from an area around Bohannon Avenue and Lewis Lane. These interceptors flow to a proposed pump station on the north side of Sites Station Road. An approximately 27,400 ft force main will run north along the east side of Dixie Highway and then northwest across Lower River Road and then north to connect into the Pond Creek Interceptor just upstream of the DRG Water Quality Treatment Center.
Total Estimated Capital Cost: $11,610,000

Alternative - One alternative to provide future sewer service to these areas is to run the Crane Run Interceptor South across Crane Run and run it along Pond Creek to intersect with the proposed Briar Creek Interceptor. This would eliminate the need for a pump station at the confluence of Crane Run and Pond Creek as well as approximately 3,890 ft of interceptor and 2,700 ft of force main. The rest of the Briar Creek Project would have the same alignments and the force main size would increase to 14-inch diameter.
Total Estimated Capital Cost: $14,927,000

The alternative capital cost for servicing future development in zones D and G by combining the projects is $14,926,800 as opposed to the total capital cost for the two projects as separate entities being $15,947,940. The alternative will eliminate the need for the extra pump station and force main which will help reduce future maintenance and the initial cost is less.

8.6.5 Zone E Development Projects

Camp Ground Road Interceptor - This proposed project is to run an approximately 2,900 ft 15-inch diameter interceptor down Camp Ground Road in order to capture potential future development in the area. The interceptor would tie into the Riverside Gardens Pump Station. Both the pump station and force main would need to be upsized. The force main would need to be upsized to a 16-inch diameter pipe and the pump station resized to handle an additional 2.93 MGD.
Total Estimated Capital Cost: $1,891,000

Mill Creek Interceptor - This proposed project is to run an approximately 5,200 ft 15-inch diameter interceptor down Camp Ground Road in order to capture potential future development in the area. The interceptor would tie into an existing 30-inch interceptor.
Total Estimated Capital Cost: $727,000

8.6.6 Zone F Development Projects

Greenbelt Highway Interceptor – This proposed project is to run approximately 9,100 ft of 12-inch diameter interceptor adjacent to Greenbelt Hwy until it crosses Mill Creek. The proposed interceptor would follow west of Mill Creek and connect into the Pond Creek Interceptor just upstream of the DRG WQTC.
Total Estimated Capital Cost: $2,149,000

Alternate - Bethany Lane Pump Station - This proposed project alternative is to run an approximately 1,400 ft 12-inch diameter interceptor adjacent to the Greenbelt Hwy in order to capture potential future development in the area. A pump station would be constructed at the intersection of Bethany Lane and the Greenbelt Hwy. An approximately 3,900 ft of 6-inch force main would be constructed to tie into an existing 15-inch interceptor on Ashby Lane.
Total Estimated Capital Cost: $2,734,000

The alternative capital cost for servicing future development in zone F is $585,000 more expensive than the Greenbelt Highway Interceptor therefore the interceptor project was the chosen alternative.

SECTION 9: CROSS-CUTTER CORRESPONDENCE AND MITIGATION

9.1 THREATENED AND ENDANGERED SPECIES

A letter was sent to the Kentucky Department of Fish and Wildlife on October 30, 2017, requesting a review of significant concerns for local fish and wildlife resources or habitat with the proposed projects. A copy of the letter and the response from the Kentucky Department of Fish and Wildlife is included in Appendix A.

A letter was sent to the United States Fish and Wildlife on October 30, 2017, requesting a review of significant concerns for local fish and wildlife resources or habitat with the proposed projects. A copy of the letter and the response from the United States Fish and Wildlife is included in Appendix A.

9.2 HISTORICAL RESOURCES

A letter was sent to the Kentucky Heritage Council on October 30, 2017, requesting a review of significant cultural or historical concerns with the proposed projects. A copy of the letter and the response from the Heritage Council is included in Appendix A.

9.3 AQUATIC RESOURCES

A letter was sent to the United States Army Corp of Engineers (USACE) on October 30, 2017, requesting a review of significant concerns for wetlands and other jurisdictional interests for the proposed projects. A copy of the letter and the response from the USACE is included in Appendix A.

9.4 AGRICULTURAL RESOURCES

A letter was sent to the Natural Resources Conservation Service on October 30, 2017, requesting a review of significant concerns for wetlands and other jurisdictional interests for the proposed projects. A copy of the letter and the response from the USACE is included in Appendix A.

9.5 KENTUCKY CLEARING HOUSE REVIEW

The Kentucky Division of Water will prepare a State Planning and Environmental Assessment Report (SPEAR) that is distributed to the following agencies:

Kentucky Department of Public Health
Kentucky Department of Fish and Wildlife Resources
Kentucky Division of Air Quality
Kentucky Division of Forestry
Kentucky Division of Waste Management
Kentucky Division of Water

SECTION 9: CROSS-CUTTER CORRESPONDENCE AND MITIGATION

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Kentucky Division of Forestry
Kentucky Division of Waste Management
Kentucky Division of Water

Kentucky Heritage Council
Kentucky State Clearinghouse
Natural Resources Conservation Service Web Soil Survey
Kentucky Geological Survey Website
United States Fish and Wildlife Service

Comments received from these agencies will be considered in approval of the Regional Wastewater Facilities Plan. MSD will satisfy all appropriate local, state and federal mitigation requirement associated with this DRG WQTC Facility Plan.

SECTION 10: EVALUATION OF RECOMMENDED REGIONAL FACILITY PLAN

10.1 ENVIRONMENTAL IMPACTS

The recommended alternative for the DRG WQTC is essentially complete, with little physical construction remaining. The work to be done onsite will have minor impact from construction traffic to the surrounding areas.

The recommended work for the collection/conveyance system will cause periodic disturbance across the service area. Each project will be evaluated for environmental and cultural impacts during planning and design. Public input will be solicited during the planning and design phases of each project.

10.2 INSTITUTIONAL STRUCTURE

MSD is public corporate body and subdivision of the Commonwealth of Kentucky. MSD has complete control, possession and supervision of the sewer and drainage system within the City of Louisville (the "City") and within large portions of Jefferson County (the "County"), which it has annexed into its service area. Chapter 76 of the Kentucky Revised Statutes authorizes MSD to construct additions, betterment's and extensions within its service area and to recover the costs of its services in accordance with rate schedules adopted by its Board.

10.3 FUNDING PLAN

MSD sets universal rates that fund its entire utility. Rates enable MSD to operate and maintain its separate sanitary sewer system, combined sewer system, regional WQTCs and small WQTCs. MSD's rates also fund compliance with its Amended Consent Decree (ACD).

MSD's current and near –term projected rates include budgets for the 0- to 2 year projects identified in this proposed plan and also include budgets for the SSDP projects. MSD's long term projected rates (as presented in the IOAP) include budgets for projects identified in the future. MSD will offset some of the annual allowances to incorporate budgets for projects identified in this proposed plan into future rate development calculations. Impacts on future long-term rates cannot be estimated at this time because of the uncertainty of other future projects that may be identified in other areas of MSD's operations and how those totals might be offset by existing budget allowances.

10.4 CURRENT AND PROJECTED RATE FEE

A copy of MSD's Wastewater service charges is shown in Appendix C. A 4,000 gallon per month sewer residential customer served by MSD currently pays a monthly sewer bill of $48.74. This includes a $11.26 surcharge for USEPA Consent Decree. MSD prepares an annual operating and capital budget every spring, which requires approval by the MSD Board. MSD also identifies the service charges needed to implement the approved operating and capital budgets. This also requires approval by the MSD Board, and under some circumstances requires approval from the Louisville Metro Council.

MSD has developed a 20-year Critical Repair and Reinvestment Plan that defines a recommended program for meeting MSD's regulatory and customer service requirements. The recommended projects identified in this RFP are included in that Plan, along with an overall financial strategy for funding. Implementation of the plan is accomplished through the budgeting and rate setting process described previously.

10.5 IMPLEMENTATION SCHEDULE

The approval process involves conducting a Public Hearing on the RFP. Citizen comments will be accepted during a 30 day comment period. MSD will address citizen comments and deliver a final plan to the KDOW for review, comment and approval.

This recommended plan identifies the priority for capital projects. MSD will begin implementation of the any 0 to 2 year projects immediately, subject to funding availability. The projects identified in the 3 to 10 year phase should proceed as the need arises, also subject to funding availability. MSD manages a capacity utilization tool to track available reserve capacity that can be used as the trigger for detailed planning.

The RFP should be reconsidered every 5 to 10 years. Changes in regulations, wasteload allocations, and development patterns may merit updates to the RFP.

SECTION 11: DOCUMENTATION OF PUBLIC PARTICIPATION

11.1 ADVERTISEMENT OF PUBLIC HEARING

Notice of Public Hearing

(Pursuant to 401 KAR 5:006 Sections 4 and 5, KRS 24 and 40 CFR 25.5 and 6)

Interested citizens of Jefferson County are invited to a public hearing sponsored by the Louisville and Jefferson County Metropolitan Sewer District. The meeting will start at 6:00 P.M. on Tuesday, February 20, 2018, at the Southwest Regional Library, 9725 Dixie Highway in Louisville, Kentucky.

MSD has completed an update to its Derek R. Guthrie Regional Water Quality Treatment Center Facilities Plan. The Facilities Plan details the recommended procedure for wastewater management within the Derek R. Guthrie Planning Area which encompasses much of Southern and Western Jefferson County. The recommended plan represents the alternative with the lowest present-worth cost, a minimal environmental impact and the highest capability for implementation. The recommended plan calls for wastewater to be collected and treated at the MSD Derek R. Guthrie Water Quality Treatment Center. The draft plan is available online at http://louisvillemsd.org/current-projects. Printed copies are available for review at the Metropolitan Sewer District office (700 W Liberty Street). These copies are available for review during normal business hours at this location until March 23, 2018.

The purpose of the public hearing is to discuss the draft plan and its contents. Verbal and written comments will be accepted at the public hearing. Written comments concerning the plan will also be accepted via mail or online at the link listed above until March 28, 2018. Written comments should be addressed to Colette Easter, Metropolitan Sewer District, 700 W. Liberty Street, Louisville, KY 40203.

11.2 ATTENDANCE AT PUBLIC HEARING

To be added at a later date.

11.3 PUBLIC COMMENTS

To be added at a later date.

11.4 RESPONSE TO PUBLIC COMMENTS

To be added at a later date.

SECTION 12: KDOW Checklist

Section 12: Regional Facility Plan Completeness Checklist and Forms

Requirements: Two (2) hard copies, one certified by a professional engineer licensed in Kentucky and one (1) non-certified digital copy of the regional facility plan and the planning area shapefile on a Compact Disc (CD) shall be submitted to the Cabinet. This completeness checklist should be completed and submitted with each regional facility plan.

Regional Planning Agency Name: Louisville and Jefferson County Metropolitan Sewer District
Date: April 13, 2017

SECTION 1

REGIONAL FACILITY PLAN SUMMARY- This section shall provide a brief summary of the information provided in the facility plan, including the following:

1.	Purpose of the plan and major problems evaluated in the plan.	S1 P1
2.	Recommended alternative chosen to remediate or correct the problems and/or serve the area of need identified in the plan. Also, include any institutional arrangements necessary to implement the recommended alternative(s).	S1 P2
3.	Estimated cost of implementing the proposed plan (including user fees) and the proposed funding method to be used.	S1 P2
4.	Planning agency commitments necessary to implement the plan.	S1 P2
5.	Schedule of implementation for projects.	S1 P2-3

SECTION 2

STATEMENT OF PURPOSE AND NEED- This section shall contain a brief description of the purpose and need for a submitting the facility plan. S2 P1-3

SECTION 3

PHYSICAL CHARACTERISTICS OF THE PLANNING AREA- This section shall delineate the planning area boundaries and describe key topographic, geographic and pertinent natural or man-made features of the area. Digital or electronic submission of the planning area boundary shapefile in a standard GIS format shall also be included. This section shall also include the following maps:

1.	One (1) up-to-date map, suitable for photocopying, indicate the planning area boundary, service area boundary, watershed boundaries, county lines, populated places, cities and/or towns and project areas or proposed planning period phases.	F 3-1
2.	One (1) up-to-date map, suitable for photocopying, include locations of wastewater treatment facilities (including package treatment plants), discharge location(s), collection lines (gravity, force main, interceptors), pump stations, public drinking water intake points and groundwater supply areas [Source Water Area Protection Plans (SWAPP) and/or Wellhead Protection Areas (WHPA)].	F 3-2
3.	One (1) seven and one-half (7 ½) minute USGS topographic map including the location of wetlands, delineation of the 100-year floodplain, surface water(s), and topography.	F 3-4 F 3-5

4.	If available, a local planning and zoning land use map.	F 3-6

SECTION 4

SOCIOECONOMIC CHARACTERISTICS OF THE PLANNING AREA- The following characteristics of the planning area shall be discussed:

1.	Historical, current, and projected population in the planning area including wastewater contributions from industrial and commercial sources.	S4 P2
2.	Current and projected population in the existing service area and unsewered parts of the planning area	S4 P2-3
3.	Economic or social benefit to the affected community	S4 P3

SECTION 5

EXISTING ENVIRONMENT IN THE PLANNING AREA- Describe existing physical, biological, cultural, and other resource features within the planning area with an emphasis on those that may be impacted by the proposed plan or projects, including the following:

1.	Physical features such as surface and groundwater quality, water sources and supply, wetlands, lakes, streams, air pollution, floodplains, soils, geology, and topography	S5 P1-3
2.	Biological: Identify plant and animal communities in the planning area with an emphasis upon endangered and threatened species likely to be impacted	S5 P4
3.	Cultural: Describe archaeological and historical resources that may be affected by the proposed project	S5 P5
4.	Other Resource Features such as national and state parks, recreational areas, USDA Designated Important Farmland, and any other applicable environmentally sensitive areas	S5 P5-6

SECTION 6

EXISTING WASTEWATER SYSTEM- This section shall be prepared by a Professional Engineer licensed in Kentucky. A description of the existing facilities within the planning area shall include the following:

1.	On-site systems in the planning area	F 6-1 S6 P1
2.	Physical condition of the existing wastewater treatment plant(s) including the type, age, design capacity, process units, peak and average wastewater flows, current discharge permit limits, schematic layout of treatment plant. Include a narrative description of the capacity of the treatment plant to meet reliability and redundancy requirements as outlined in regulation 401 KAR 5:005, Section 13.	S6 P1-8
3.	Existing collection and conveyance system and its condition	S6 P9-14
4.	Existing biosolids disposal method	S6 P14
5.	Existing operation, maintenance and compliance issues	S6 P14-15

SECTION 7

FORECASTS OF FLOWS AND WASTE LOADS IN THE PLANNING AREA- This section shall be prepared by a professional engineer licensed in Kentucky and shall include:

1.	Current and projected commercial, industrial and residential growth for the proposed	S7 P1-3

planning period

2.	A copy of the waste load allocation (WLA) issued by the DOW for new or expanded treatment plant projects	S7 P5-6

SECTION 8

EVALUATION OF ALTERNATIVES- This section shall be prepared by a professional engineer licensed in Kentucky and include an assessment of alternatives to determine the appropriate facilities that will meet the wastewater needs of the planning area and provide benefits that are cost-effective and environmentally sound. The section shall include:

1.	No-action alternative	S8 P1
2.	Optimization of existing facilities	S8 P2
3.	Regionalization	S8 P3
4.	Other alternatives	
5.	Detailed cost analysis along with 20 year present worth analysis for each alternative	S8 P5-11
6.	Recommended alternative	S8 P5 S8 P8-11

SECTION 9

CROSS-CUTTER CORRESPONDENCE AND MITIGATION- Each facility plan shall include cross-cutter correspondences to and from each agency related to the following four environmental and cultural concerns:

1. Threatened and Endangered Species: The U.S. Fish and Wildlife Service- Kentucky Ecological Services Field Station and the Kentucky Department of Fish and Wildlife Resources
2. Historical Resources: The Kentucky Heritage Council State Historic Preservation Office
3. Aquatic Resources: The US. Army Corps of Engineers (Louisville, Nashville, or Huntington Districts).
4. Agricultural Resources: The local office of the Natural Resources Conservation Service (NRCS) or USDA Service Center

SECTION 10

EVAULATION OF RECOMMENDED REGIONAL FACILITY PLAN- This section of the facility plan shall summarize the critical components of the recommended plan.

1.	Environmental impacts	S10 P1
2.	Institutional structure	S10 P1
3.	Funding plan	S10 P1
4.	Current and projected residential user charge rate based on 4,000 gallon usage per month	S10 P2
5.	Implementation schedule	S10 P2

SECTION 11

DOCUMENTATION OF PUBLIC PARTICIPATION- The section shall include a copy of the newspaper advertisement/proof of publication, attendance sheet, and public comments.

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Safe, clean waterways

700 West Liberty Street | Louisville, KY 40203-1911
Phone: 502.540.6000 | LouisvilleMSD.org

November 6, 2017

Mr. David Baldridge
USACE Chief, South Branch
600 Dr. Martine Luther King Jr. Place
Louisville, KY 40202-0059

Subject: Derek R. Guthrie Regional Facilities Plan 2017

Dear Mr. Baldridge,

Louisville and Jefferson County Metropolitan Sewer District (MSD) is preparing the Derek R. Guthrie (DRG) Regional Facilities Plan (Plan) for re-rating of capacity from the current 30 million gallons per day (mgd) Average Daily Flow (ADF) to 60 mgd. MSD and CH2M have evaluated the DRG plant for wastewater conveyance and treatment needs through 2036. This long term Plan was developed for providing effective and efficient sanitary service to MSD customers within the planning area along with ensuring compliance with US EPA's Amended Consent Decree (ACD).

As part of MSD's strategy to comply with the ACD, MSD developed an Integrated Overflow Abatement Plan (IOAP). This plan included many projects to reduce the frequency and volume of sewer overflows at many locations in the service area and instead convey the maximum amount of sanitary sewer flow to the DRG plant during peak flow events. Included in the plan was a diversion structure to transfer flow from the Morris Forman Service area to the DRG service area during peak flow events in order to optimize the total amount of sewage treated and reduce the overall amount of sewer overflow in both service areas. In order to treat the higher flow rates during peak flow events, much of the DRG WQTC was upgraded to handle higher wet weather flow rates. This project included new clarifiers, a new influent pump station a large equalization basin among other changes at the plant. This allowed the plant to handle up to 200 MGD through the plant with any additional flow being stored in the equalization basin. Due to the high peak flow rates during wet weather events, the overall average daily flow is anticipated to reach 60 MGD over the 20 year planning horizon. The plan recommends additional modifications to the plant as well as anticipates the need for several collection systems projects to handle additional growth in the county over the next 20 years. These anticipated projects and their current status are summarized in Table 1 below. Additional information on these current and future projects can be found in Sections 1 and 8 of the DRG Plan.

Table 1 Recommended WQTC Projects

WQTC Projects	Status
Return Activated Sludge Pump and Piping Upgrades	Will be completed October 2018
Air Piping Replacement for Aeration Basins	Planning Phase
Bear Camp Creek Interceptor Projects	Planning Phase (3-10 Years)
Cane Creek To Briar Creek Combination Project	Planning Phase (11-20 Years)
Greenbelt Highway Interceptor	Planning Phase (11-20 Years)

Jefferson Hill Road Interceptor	Planning Phase (3-10 Years)
Riverside Gardens Pump Station Expansion	Planning Phase (11-20 Years)

MSD is not aware of any impacts to wetlands as the result of the proposed projects. Construction activities proposed will occur in the future and a full project plan will be submitted to the USACE Regulatory Branch prior to construction of these projects.

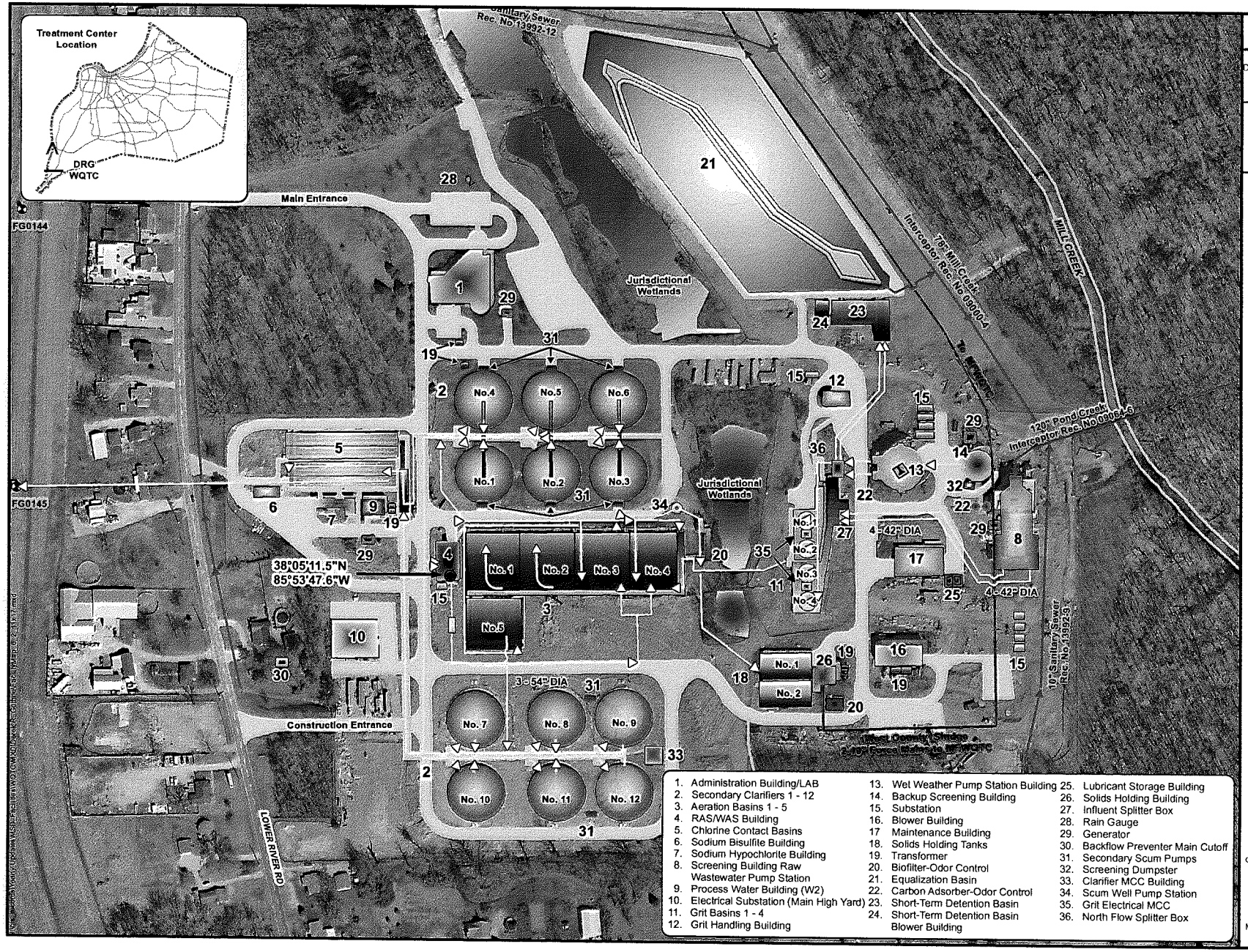
Please review the proposed projects and reply with any concerns regarding local historical or archaeological resources that may be affected. Your comments will be incorporated into the Derek R. Guthrie Regional Facilities Plan, which will be reviewed and approved by the Kentucky Division of Water. If you have any further questions please contact Jason Dempster at (502)-540-6107 or colette.easter@louisvillemsd.org.

Sincerely,

Colette Easter, P.E.
Engineer II – Infrastructure Planning

CRE USACE Cross-cutter Letter.docx

cc: John Loechle, P.E. | Engineering Director
Stephanie Laughlin, P.E. | Infrastructure Planning Program Manager



1. Administration Building/LAB
2. Secondary Clarifiers 1 - 12
3. Aeration Basins 1 - 5
4. RAS/WAS Building
5. Chlorine Contact Basins
6. Sodium Bisulfite Building
7. Sodium Hypochlorite Building
8. Screening Building Raw Wastewater Pump Station
9. Process Water Building (W2)
10. Electrical Substation (Main High Yard)
11. Grit Basins 1 - 4
12. Grit Handling Building
13. Wet Weather Pump Station Building
14. Backup Screening Building
15. Substation
16. Blower Building
17. Maintenance Building
18. Solids Holding Tanks
19. Transformer
20. Biofilter-Odor Control
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29. Generator
30. Backflow Preventer Main Cutoff
31. Secondary Scum Pumps
32. Screening Dumpster
33. Clarifier MCC Building
34. Scum Well Pump Station
35. Grit Electrical MCC
36. North Flow Splitter Box

Figure: 6-2

DEREK R. GUTHRIE FACILITES PLAN UPDATE
LOUISVILLE AND JEFFERSON COUNTY METROPOLITAN SEWER DISTRICT

DEREK R GUTHRIE WATER QUALITY TREATMENT CENTER

Flow Type

- Process
- Force Main
- Sanitary Sewer
- Streams
- Flood Gates

0 100 200 Feet

1 inch equals 200 feet

NOTE:
This plan is intended to be a representation of plant flows. For more detailed information see Record Drawing No.12484

msd
more than waterways

LOJIC

Map Prepared by MSD GIS Services and Records

Map Created: 10/3/2017

msd
Safe, clean waterways

700 West Liberty Street | Louisville, KY 40203-1911
Phone: 502.540.6000 | LouisvilleMSD.org

November 6, 2017

Ms. Teresa Welch
US Fish and Wildlife
330 West Broadway Suite 265
Frankfort, KY 40601

Subject: Derek R. Guthrie Regional Facilities Plan 2017

Dear Ms. Welch,

Louisville and Jefferson County Metropolitan Sewer District (MSD) is preparing the Derek R. Guthrie (DRG) Regional Facilities Plan (Plan) for re-rating of capacity from the current 30 million gallons per day (mgd) Average Daily Flow (ADF) to 60 mgd. MSD and CH2M have evaluated the DRG plant for wastewater conveyance and treatment needs through 2036. This long term Plan was developed for providing effective and efficient sanitary service to MSD customers within the planning area along with ensuring compliance with US EPA's Amended Consent Decree (ACD).

As part of MSD's strategy to comply with the ACD, MSD developed an Integrated Overflow Abatement Plan (IOAP). This plan included many projects to reduce the frequency and volume of sewer overflows at many locations in the service area and instead convey the maximum amount of sanitary sewer flow to the DRG plant during peak flow events. Included in the plan was a diversion structure to transfer flow from the Morris Forman Service area to the DRG service area during peak flow events in order to optimize the total amount of sewage treated and reduce the overall amount of sewer overflow in both service areas. In order to treat the higher flow rates during peak flow events, much of the DRG WQTC was upgraded to handle higher wet weather flow rates. This project included new clarifiers, a new influent pump station a large equalization basin among other changes at the plant. This allowed the plant to handle up to 200 MGD through the plant with any additional flow being stored in the equalization basin. Due to the high peak flow rates during wet weather events, the overall average daily flow is anticipated to reach 60 MGD over the 20 year planning horizon. The plan recommends additional modifications to the plant as well as anticipates the need for several collection systems projects to handle additional growth in the county over the next 20 years. These anticipated projects and their current status are summarized in Table 1 below. Additional information on these current and future projects can be found in Sections 1 and 8 of the DRG Plan.

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MSD is not aware of any impacts to any threatened or endangered species and their habitat as the result of the proposed projects. Construction activities proposed will occur in the future and a full project plan will be submitted to the United States Department of Fish and Wildlife prior to construction of these projects.

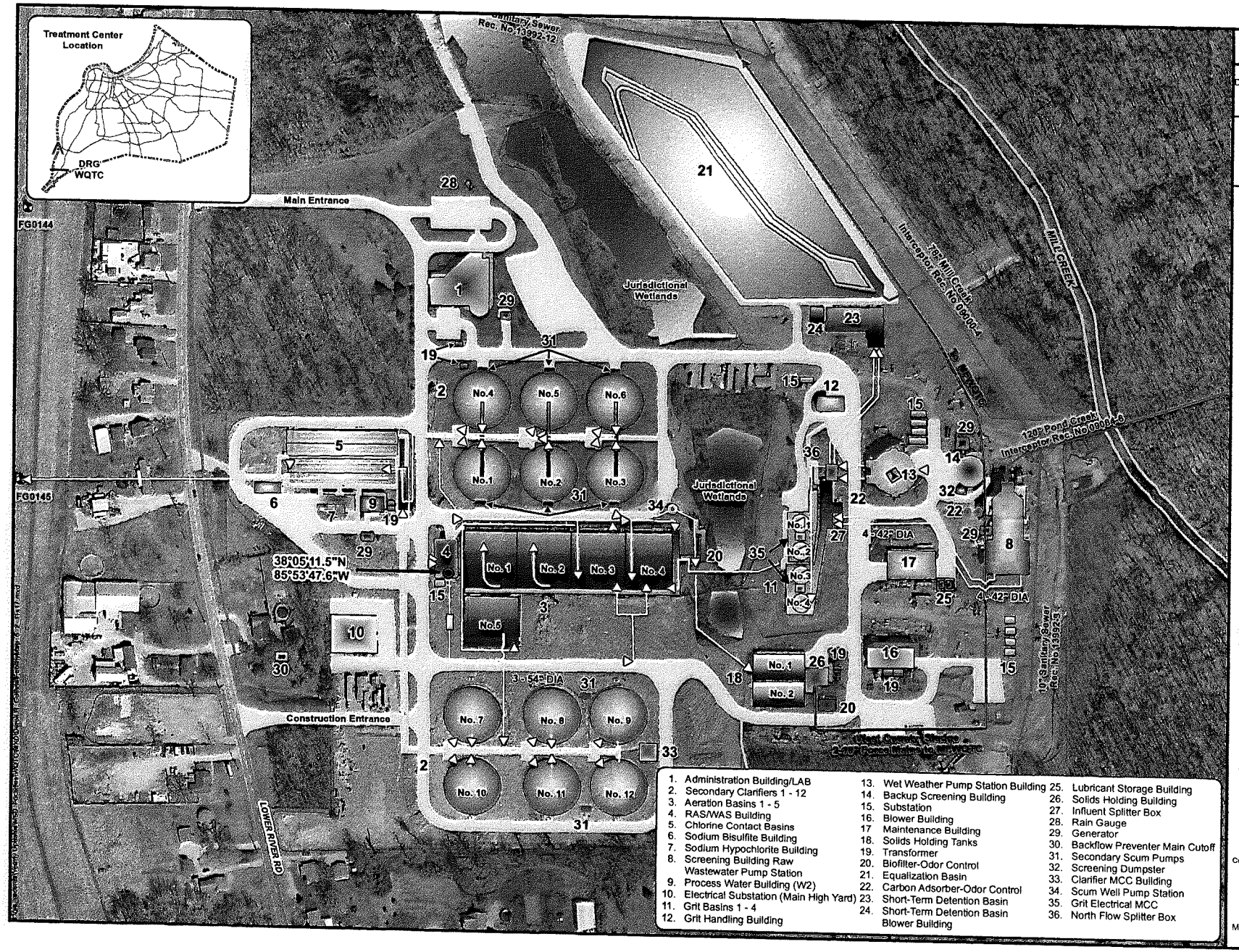
Please review the proposed projects and reply with any concerns regarding local historical or archaeological resources that may be affected. Your comments will be incorporated into the Derek R. Guthrie Regional Facilities Plan, which will be reviewed and approved by the Kentucky Division of Water. If you have any further questions please contact Colette Easter at (502)-540-6107 or colette.easter@louisvillemsd.org.

Sincerely,

Colette Easter, P.E.
Engineer II – Infrastructure Planning

CRE US Fish and Wildlife Cross-cutter Letter.docx

cc: John Loechle, P.E. | Engineering Director
Stephanie Laughlin, P.E. | Infrastructure Planning Program Manager



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DEREK R. GUTHRIE FACILITES PLAN UPDATE
LOUISVILLE AND JEFFERSON COUNTY METROPOLITAN SEWER DISTRICT

DEREK R GUTHRIE WATER QUALITY TREATMENT CENTER

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NOTE:

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msd

LOJIC

Map Prepared by MSD GIS Services and Records

Map Created: 10/2/2017

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700 West Liberty Street | Louisville, KY 40203-1911
Phone: 502.540.6000 | LouisvilleMSD.org

November 6, 2017

Mrs. Karen Woodrich
State Conservationist
NRCS State Office
771 Corporate Drive Suite 300
Lexington, KY 40503

Subject: Derek R. Guthrie Regional Facilities Plan 2017

Dear Mrs. Woodrich,

Louisville and Jefferson County Metropolitan Sewer District (MSD) is preparing the Derek R. Guthrie (DRG) Regional Facilities Plan (Plan) for re-rating of capacity from the current 30 million gallons per day (mgd) Average Daily Flow (ADF) to 60 mgd. MSD and CH2M have evaluated the DRG plant for wastewater conveyance and treatment needs through 2036. This long term plan was developed for providing effective and efficient sanitary service to MSD customers within the planning area along with ensuring compliance with US EPA's Amended Consent Decree (ACD).

As part of MSD's strategy to comply with the ACD, MSD developed an Integrated Overflow Abatement Plan (IOAP). This plan included many projects to reduce the frequency and volume of sewer overflows at many locations in the service area and instead convey the maximum amount of sanitary sewer flow to the DRG plant during peak flow events. Included in the plan was a diversion structure to transfer flow from the Morris Forman Service area to the DRG service area during peak flow events in order to optimize the total amount of sewage treated and reduce the overall amount of sewer overflow in both service areas. In order to treat the higher flow rates during peak flow events, much of the DRG WQTC was upgraded to handle higher wet weather flow rates. This project included new clarifiers, a new influent pump station a large equalization basin among other changes at the plant. This allowed the plant to handle up to 200 MGD through the plant with any additional flow being stored in the equalization basin. Due to the high peak flow rates during wet weather events, the overall average daily flow is anticipated to reach 60 MGD over the 20 year planning horizon. The plan recommends additional modifications to the plant as well as anticipates the need for several collection systems projects to handle additional growth in the county over the next 20 years. These anticipated projects and their current status are summarized in Table 1 below. Additional information on these current and future projects can be found in Sections 1 and 8 of the DRG Plan.

Table 1 Recommended WQTC Projects

WQTC Projects	Status
Return Activated Sludge Pump and Piping Upgrades	Will be completed October 2018
Air Piping Replacement for Aeration Basins	Planning Phase
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Cane Creek To Briar Creek Combination Project	Planning Phase (11-20 Years)
Greenbelt Highway Interceptor	Planning Phase (11-20 Years)

Jefferson Hill Road Interceptor	Planning Phase (3-10 Year)
Riverside Gardens Pump Station Expansion	Planning Phase (11-20 Year)

MSD is not aware of any agricultural resources that would be impacted by the proposed projects. Construction activities proposed will occur in the future and a full project plan will be submitted to the Natural Resource Conservation State Office prior to construction of these projects.

Please review the proposed projects and reply with any concerns regarding local historical or archaeological resources that may be affected. Your comments will be incorporated into the Derek R. Guthrie Regional Facilities Plan, which will be reviewed and approved by the Kentucky Division of Water. If you have any further questions please contact Colette Easter at (502)-540-6107 or colette.easter@louisvillemsd.org.

Sincerely,

Colette Easter, P.E.
Engineer II – Infrastructure Planning

CRE NRCS Cross-cutter Letter.docx

cc: John Loechle, P.E. | Engineering Director
Stephanie Laughlin, P.E. | Infrastructure Planning Program Manager

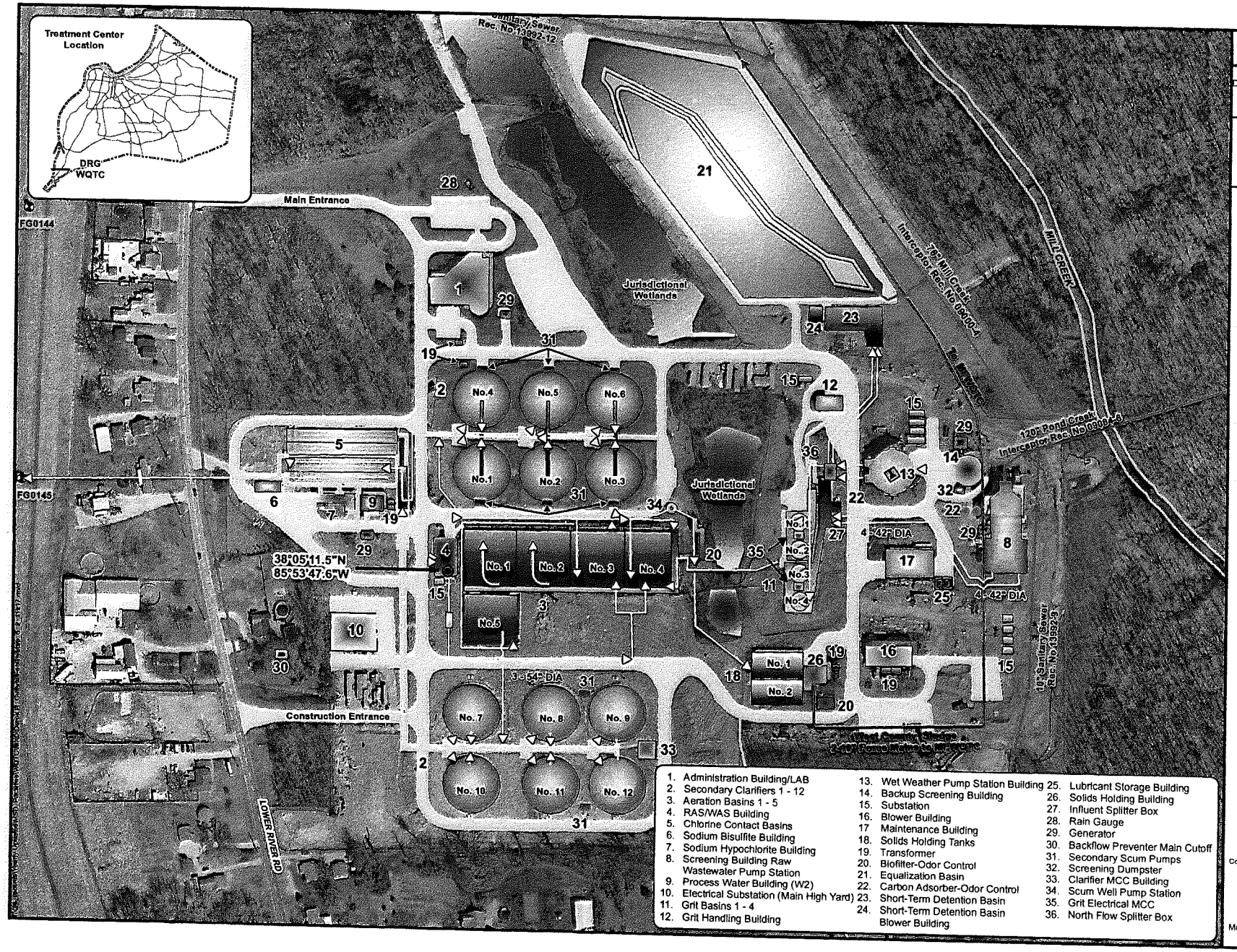

Figure: 6-2

DEREK R. GUTHRIE FACILITES PLAN UPDATE
LOUISVILLE AND JEFFERSON COUNTY METROPOLITAN SEWER DISTRICT

DEREK R GUTHRIE WATER QUALITY TREATMENT CENTER

Flow Type

- Process
- Force Main
- Sanitary Sewer
- Streams
- Flood Gates

0 100 200 Feet

1 inch equals 200 feet

NOTE:
This plan is intended to be a representation of plant flows. For more detailed information see Record Drawing No.12484

msd

LOJIC

Map Prepared by MSD GIS Services and Records

Map Created, 10/2/2017

msd
Safe, clean waterways

700 West Liberty Street | Louisville, KY 40203-1911
Phone: 502.540.6000 | LouisvilleMSD.org

November 6, 2017

Mr. Doug Dawson
KY Fish and Wildlife
#1 Sportsman's Lane
Frankfort, KY 40601

Subject: Derek R. Guthrie Regional Facilities Plan 2017

Dear Mr. Dawson,

Louisville and Jefferson County Metropolitan Sewer District (MSD) is preparing the Derek R. Guthrie (DRG) Regional Facilities Plan (Plan) for re-rating of capacity from the current 30 million gallons per day (mgd) Average Daily Flow (ADF) to 60 mgd. MSD and CH2M have evaluated the DRG plant for wastewater conveyance and treatment needs through 2036. This long term Plan was developed for providing effective and efficient sanitary service to MSD customers within the planning area along with ensuring compliance with US EPA's Amended Consent Decree (ACD).

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MSD is not aware of any impacts to any threatened or endangered species and their habitat as the result of the proposed projects. Construction activities proposed will occur in the future and a full project plan will be submitted to the Kentucky Department of Fish and Wildlife prior to construction of these projects.

Please review the proposed projects and reply with any concerns regarding local historical or archaeological resources that may be affected. Your comments will be incorporated into the Derek R. Guthrie Regional Facilities Plan, which will be reviewed and approved by the Kentucky Division of Water. If you have any further questions please contact Colette Easter at (502)-540-6107 or colette.easter@louisvillemsd.org.

Sincerely,

Colette Easter, P.E.
Engineer II – Infrastructure Planning

CRE KY Fish and Wildlife Cross-cutter Letter.docx

cc: John Loechle, P.E. | Engineering Director
Stephanie Laughlin, P.E. | Infrastructure Planning Program Manager

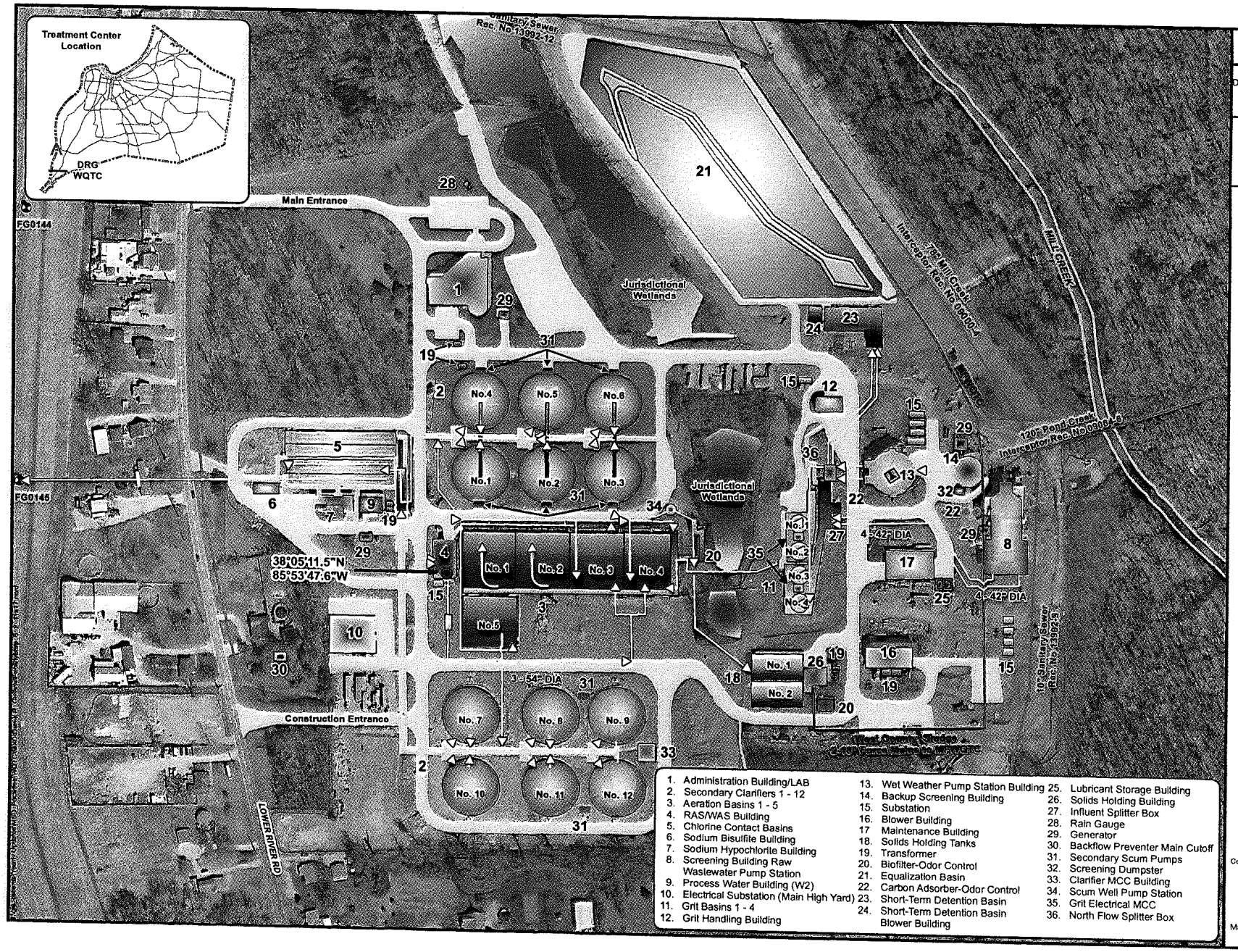

Figure: 6-2

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Map Created: 10/3/2017

msd
Safe, clean waterways

700 West Liberty Street | Louisville, KY 40203-1911
Phone: 502.540.6000 | LouisvilleMSD.org

November 6, 2017

Mr. Nicolas Laracuente
Heritage Council
410 High Street
Frankfort, KY 40601

Subject: Derek R. Guthrie Regional Facilities Plan 2017

Dear Mr. Laracuente,

Louisville and Jefferson County Metropolitan Sewer District (MSD) is preparing the Derek R. Guthrie (DRG) Regional Facilities Plan (Plan) for re-rating of capacity from the current 30 million gallons per day (mgd) Average Daily Flow (ADF) to 60 mgd. MSD and CH2M have evaluated the DRG plant for wastewater conveyance and treatment needs through 2036. This long term Plan was developed for providing effective and efficient sanitary service to MSD customers within the planning area along with ensuring compliance with US EPA's Amended Consent Decree (ACD).

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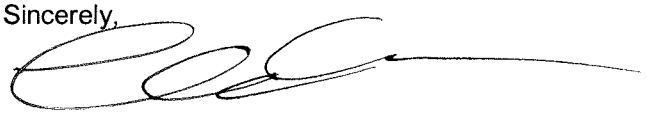
Riverside Gardens Pump Station Expansion	Planning Phase (11-20 Years)

MSD is not aware of any impacts to local historical or archaeological resources as the result of the proposed projects. Construction activities proposed will occur in the future and a full project plan will be submitted to the Heritage Council prior to construction of these projects.

Please review the proposed projects and reply with any concerns regarding local historical or archaeological resources that may be affected. Your comments will be incorporated into the Derek R. Guthrie Regional Facilities Plan, which will be reviewed and approved by the Kentucky Division of Water. If you have any further questions please contact Colette Easter at (502)-540-6107 or colette.easter@louisvillemsd.org.

Sincerely,



Colette Easter, P.E.
Engineer II – Infrastructure Planning

CRE Heritage Council Cross-cutter Letter.docx

cc: John Loechle, P.E. | Engineering Director
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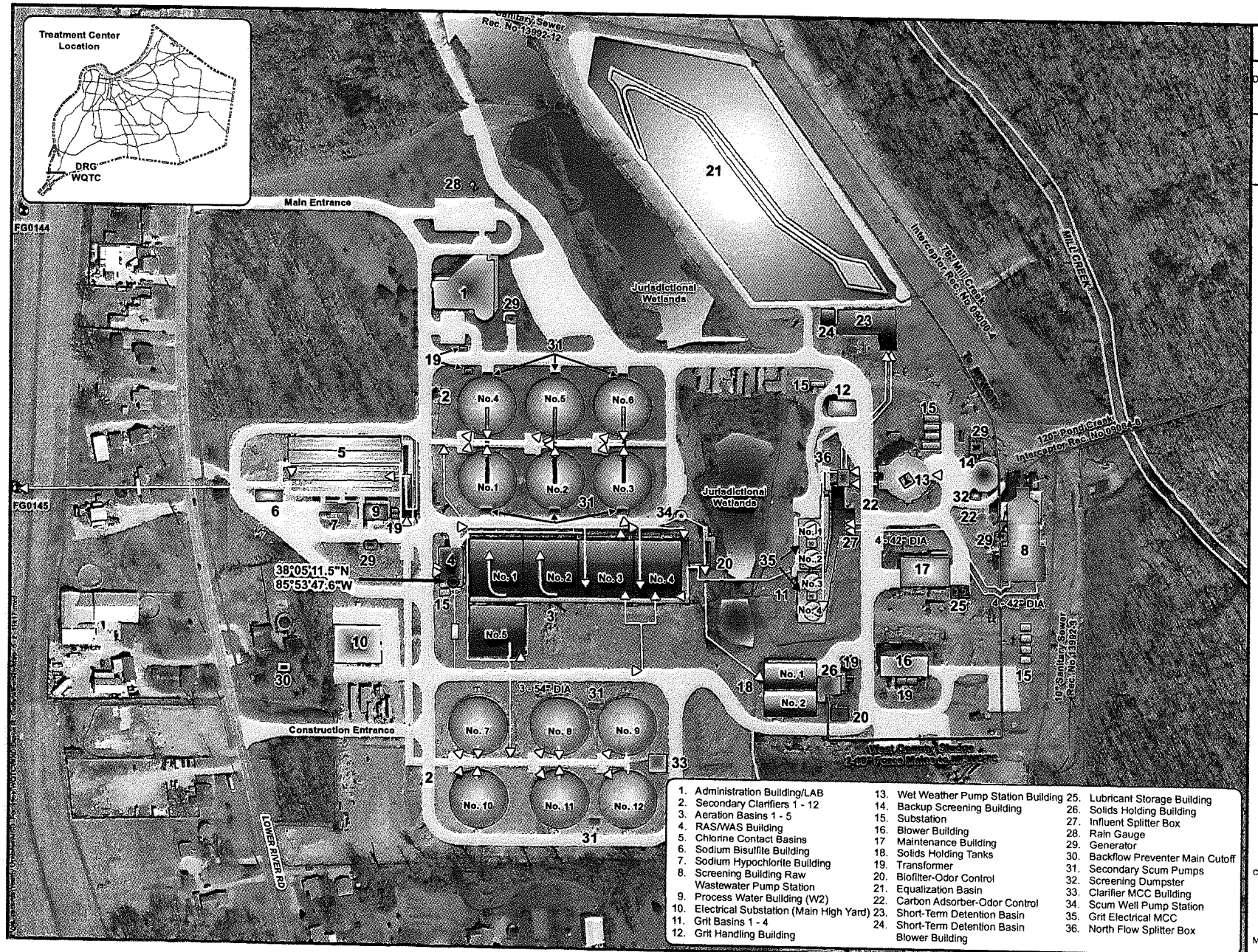

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Map Prepared by MSD GIS Services and Records

Map Created: 10/3/2017

Louisville & Jefferson County
Metropolitan Sewer District

PRELIMINARY SCHEDULE OF RATES, RENTALS & CHARGES

EFFECTIVE: AUGUST 1, 2014

1.0 WASTEWATER SERVICE CHARGES

The Wastewater Service Charge is a fixed service charge based on the size of the water meter and applies to all wastewater service charge billings. The Wastewater Service Charge shall be calculated using the table below and may be prorated based on the number of actual days in a billing cycle:

1.1 Commercial/Industrial Charges:

Meter Size Inches	Monthly Billing $/Bill	Bi-Monthly Billing $/Bill	Meter Size Inches	Monthly Billing $/Bill	Bi-Monthly Billing $/Bill
5/8 or 3/4	18.76	24.44	6	403.58	793.18
1	32.71	49.08	8	606.58	1189.79
1-1/2	49.08	81.66	10	793.18	1563.10
2	63.02	111.99	12	1151.56	2303.13
3	133.30	249.66	15 or 16	1395.85	2791.62
4	210.04	403.66	18 or 20	1832.02	3664.04

1.2 Residential Charges:

Meter Size Inches	Monthly Billing $/Bill	Bi-Monthly Billing $/Bill
5/8 or 3/4	12.22	24.44
1	24.54	49.08
1-1/2	40.83	81.16
2	55.99	111.99
3	124.83	249.66
4	201.83	403.66

1.3 Meter Read Charge:

An additional charge of **$81.58** shall be applied for each reading of each meter owned by a customer for the purpose of determining billable consumption. Examples of these meters are effluent flow meters, addition and subtraction meters.

2.0 WASTEWATER VOLUME CHARGES

The Wastewater Volume Charge is based on either water used as measured by a Louisville Water Company (LWC) meter(s) or wastewater discharged to the public sewer that is directly measured by either a private effluent flow meter(s) or calculated using a combination of addition meters (LWC meters/effluent flow meters) and subtraction meters that have been certified by the MSD

Finance Division for billing purposes. Wastewater Volume Charges may be modified from time to time by contractual agreement with individual customers. Wastewater Volume Charges are calculated based on the following rates:

2.1 Regular Volume Rate

The Regular Volume Rate shall be applicable to all water used and not meeting the requirements of Optional Volume Rate as described in Section 2.2 below. The Residential Regular Volume Rate is calculated to provide a year-long 15% discount for lawn watering and other uses of water which does not enter the public sewer. In addition, the Regular Volume Rate is calculated to provide automatic year round volume rate discounts of 10% for Commercial and Institutional customers and 5% for Industrial customers.

Residential - $3.34 per 1,000 gallons of volume billed
Commercial - $3.86 per 1,000 gallons of volume billed
Industrial - $4.02 per 1,000 gallons of volume billed

Commercial, Institutional and Industrial facilities on the Regular Volume Rate that are subject to a Quality Charge Rate shall pay Excess Quality Charges as described in Section 3.1 below.

2.2 Optional (Clean) Volume Rate

The Optional Volume Rate shall be available to customers whose average water use or wastewater discharged to the public sewer during any consecutive twelve-month period exceeds 1,000,000 gallons per month. Commercial, Institutional and Industrial customers on the Optional Volume Rate that are subject to a Quality Charge Rate shall pay Total Quality Charges as described in Section 3.2 below.

$2.28 per 1,000 gallons of volume billed

2.3 Sewer Only Volume Rate

The Sewer Only Volume Rate shall be applicable to wastewater discharged to the public sewer that is directly measured by either a private effluent flow meter(s) or calculated using a combination of addition meters (LWC meters/effluent flow meters) and subtraction meters. All effluent flow meters, addition and subtraction meters shall be inspected and certified by the MSD Finance Division prior to being used for billing purposes.

Residential - $3.85 regular rate
Commercial - $4.31 regular rate or $2.45 optional rate/1,000 gallons
Industrial - $4.34 regular rate or $2.45 optional rate/1,000 gallons

2.4 EPA Consent Decree Surcharge

The EPA Consent Decree Surcharge shall be applicable to the following billings:

Residential - **$9.98** per month or **$19.96** bi-monthly

Condominium complexes without water meters for each condominium - greater of **$9.98** per month or **$1.67** per thousand gallons of water billed
Commercial Regular Volume Rate - greater of **$9.98** per month or **$1.19** per thousand gallons of water billed
Commercial Sewer Only Volume Rate - greater of **$9.98** per month or $**1.33** per thousand gallons of wastewater discharged
Industrial Regular Volume Rate - greater of **$9.98** per month or **$1.24** per thousand gallons of water billed
Industrial Sewer Only Volume Rate - greater of **$9.98** per month or **$1.33** per thousand gallons of wastewater discharged
Optional (clean) Volume Rate - greater of **$9.98** per month or **$.71** per thousand gallons of water billed
Optional (sewer only) Volume Rate - greater of **$9.98** per month or **$.76** per thousand gallons of wastewater discharged

3.0 WATER QUALITY CHARGES

Commercial, Institutional and Industrial customers that discharge wastewater to the public sewer characterized by excess strength of Biochemical Oxygen Demand (BOD) and/or Total Suspended Solids (TSS) shall be assessed a Quality Charge Rate established by MSD.

Any Commercial, Institutional or Industrial customer who is deemed eligible to be placed on a Quality Charge Rate by MSD shall have their wastewater tested for the purpose of accessing a quality charge billing rate in addition to the volume rate applied.

MSD shall at all times have access to the premises of a customer for the purpose of determining an appropriate Quality Charge Rate. Quality Charge Rates shall be based on sampling and analyses conducted by MSD personnel using MSD protocols and methods, unless otherwise approved by the MSD Board.

MSD shall set the frequency and duration for Quality Charge Rate sampling events. MSD will take business cycle fluctuations that may affect loadings into consideration when determining sampling frequency and duration.

MSD may establish standard BOD and TSS loadings for a specific customer class which shall be used to assess applicable Quality Charge Rates.

MSD may use other methods such as contractual agreements to determine a Quality Charge Rate for individual customers for which standard sampling and analyses do not represent the actual BOD and/or TSS concentrations being discharged to the public sewer.

3.1. Excess Quality Charges

Excess Quality Charges shall apply to Commercial, Institutional and Industrial customers paying the Regular Volume Rate as follows:

BOD Concentration: $0.003181 per mg/liter in excess of 250 mg/liter billed per 1,000 gallons of water recorded by a LWC meter OR wastewater discharged to the public sewer as directly measured by an effluent flow meter; and/or

TSS Concentration: $0.00131076 per mg/liter in excess of 270 mg/liter billed per 1,000 gallons of water recorded by a LWC meter OR wastewater discharged to the public sewer as directly measured by an effluent flow meter.

3.2. Total Quality Charges

3.21 Total Quality Charges shall apply to Commercial, Institutional and Industrial customers paying the Optional Volume Rate as follows:

3.2.2 BOD Concentration: $0.003181 per mg/liter billed per 1,000 gallons of water recorded by a LWC meter OR wastewater discharged to the public sewer as directly measured by an effluent flow meter; and/or

3.2.3 TSS Concentration: $0.00131076 per mg/liter billed per 1,000 gallons of water recorded by a LWC meter OR wastewater discharged to the public sewer as directly measured by an effluent flow meter.

4.0 FLAT RATE CHARGE FOR RESIDENTIAL CUSTOMER

The following flat rate wastewater service charges shall be applicable to any single-family residential customer without a metered public water service:

$38.86 monthly plus $9.98 EPA Consent Decree Surcharge
-OR-
$64.63 bi-monthly plus $19.96 EPA Consent Decree Surcharge

5.0 PENALTY CHARGE

Delinquent Bill Penalty shall be added to all wastewater service bills not paid by their due dates in accordance with the penalty policy in use by the Louisville Water Company, MSD's billing and collection agent, or as otherwise determined by MSD.

6.0 UNUSUAL INCIDENT CHARGE

Any business, firm or individual introducing into MSD's sewer system a substance detrimental to MSD's sewers, wastewater treatment facilities, pumping facilities or wastewater treatment processes, or which results in abnormal costs for MSD, shall be charged and shall pay the actual total costs incurred as determined by MSD.

7.0 DEBT SERVICE ADJUSTMENT

Whenever MSD's net revenues are less than 1.10 times the debt service on MSD's outstanding revenue bonds for any consecutive six-month period, by order of the Board of MSD, a schedule of wastewater service charges shall be amended in order to maintain a 1.10 debt service coverage required by MSD's 1971 Bond Authorizing Resolution which was approved by the City of Louisville Ordinance Number 86, Series 1971; provided the aggregate of such adjustments for any twelve-month period shall not generate additional revenue from wastewater service charges and drainage service charges in excess of 7%.

The term, "net revenues" is defined as gross revenue from wastewater service charges and drainage service charges less operating expenses and debt payments other than debt service payments on MSD's outstanding revenue bonds.

8.0 CONNECTION FEES

8.1 A property service connection is the physical connection from MSD's public sewer to the property to be served or the easement line.

8.2 A Connection Fee is applicable for the first and subsequent connections to property which had not been previously assessed or otherwise charged or credited for the cost of the sewer serving the property; and, under any of the following circumstances:

8.2.1 whenever a physical connection to MSD's public sewer is required to be constructed; or,

8.2.2 a working and usable connection is present but there exists a previous commitment or obligation to pay a connection fee to MSD on the part of the current property owner or previous property owners; or

8.2.3 a property had been previously assessed for the cost of a sewer but not for the cost of a property service connection, or had not been otherwise charged for the cost of a property service connection.

8.3 MSD's Connection Fee is not due for connections to MSD's sanitary sewer system under any of the following circumstances:

8.3.1 a working and usable connection exists that serves the property that was constructed and accepted by MSD prior to August 1, 1998; or,

8.3.2 a property is being served by an MSD assessment project and the property is being assessed; or,

8.3.3 a property is being served as part of a new development being constructed under the provisions of an MSD's Lateral Extension (LE) Contract and the property owner is a third party beneficiary of the LE Contract; or,

8.3.4 connections to MSD's sewer system are exempted by a previously executed agreement with MSD; or,

8.3.5 the Connection Fee is exempted from payment by another provision of these Rates, Rental and Charges; or

8.3.6 the Connection Fee has been specifically exempted by action of the MSD Board.

8.4 Connection Fees are not applicable to:

8.4.1 Homes built by, or on behalf of, an organization which is either exempt from Federal income tax under 26 U.S.C. & 501 (c)(3)of the Internal Revenue Code, or is a government entity; and sold to buyers who qualify according to the income guidelines established by MSD; and,

8.4.2 a property for which a federal low income housing tax credit is not being taken by any entity or individual; and

8.4.3 a property which has a sales price which qualifies under price guidelines established by MSD.

8.5 The Connection Fee shall be equal to the actual construction cost plus a $250.00 administrative fee.

8.5.1 The cost of the connection must be paid prior to the installation of the connection.

8.6 A special MSD connection fee is due and payable for those properties to be served in the vicinity of a MSD Assessment Project (whether connecting to an interceptor or a collector line) that will be equal to the most similar Guaranteed Maximum Assessment Project (GMA). After three years from the issuance of warrants for the assessment project, the amount paid shall be the greater of the GMA or the current applicable connection fee.

8.7 Connection Fees may be paid by any method approved by MSD including the use of installment plans in accordance with the procedures and at interest rates approved by the MSD Board. However, the Connection Fees shall be assessed against the properties pursuant to the assessment method described in KRS 76.172.

8.8 The construction of connections shall be by a qualified contractor subject to MSD's inspection and approval.

9.0 CAPACITY CHARGE

9.1 MSD is the designated management agency for the implementation of the Master Plan for sewering Jefferson County, and must eventually provide capacity within the comprehensive public sewage system for all developed properties within Jefferson County. New development, even when using MSD's existing capacity, contributes to future capacity needs. Therefore, Capacity Charges shall be collected from developers of properties to help defray the future cost of providing Master Plan sewerage facilities.

9.2 When a developer of property wishes to provide sewer service by extension of or connection to MSD's sewer system, the developer, in addition to providing and paying for sewerage facilities necessary for the development, shall pay a Capacity Charge in advance of connection to MSD's wastewater treatment facilities. For developments served by MSD sewer extensions, the developer shall pay the applicable Capacity Charge at the time of execution of the sewer extension contract, or shall submit an irrevocable Letter of Credit from a local bank or other financial institution which guarantees MSD payment in full at MSD's request after the sewers are installed and connected to MSD's sewer system and before MSD issues its formal acceptance to the sewer extensions.

9.3 The Capacity Charge shall be calculated by multiplying the unit capacity charge times the gallons per day estimated to flow from a new development connecting to MSD's sewer system as determined by MSD. The unit capacity charge (value per gallon) shall be calculated by dividing MSD's Net Worth (system value) by MSD's total system-wide design capacity. For any calendar year, the unit capacity charge shall be based on MSD's

net worth as reported in the Annual Audit Report for the fiscal year ended the June 30 prior to the calendar year.

9.4 Capacity Charges are not applicable to the following:

9.4.1 Existing developed properties connecting to MSD's system but previously served by another (non MSD) sewer system or on-lot wastewater disposal system.

9.4.2 Properties to be served by a new wastewater treatment plant to be owned by MSD and constructed and financed jointly by agreement between MSD and one or more developers; however, the prorated shares of the developers' capital costs based on their estimated use of design capacity, shall not be less than the amounts MSD would recover by using the Capacity Charge calculations. Properties in the service area not party to the agreement will pay the Capacity Charges.

9.4.3 Properties owned by Metro Government, or joint agencies of Metro Government.

9.4.4 Properties which connect prior to January 1, 1993 to an MSD sewer which was installed and available in an abutting right of way or easement as of January 1, 1987, provided that the properties were annexed into MSD's wastewater service area at the written request of the owners dated and received by MSD prior to January 1, 1987, and provided the properties are being developed, or have recently been developed, at the time of connection.

9.4.4.1 Properties within the boundaries of the City of Louisville which, in 1946 transferred the then existing City sewerage system to MSD at no cost to MSD. Funds collected by the capacity charge shall be used to finance future sewerage expansion that will serve new development.

9.4.4.2 Properties located within an "Enterprise Zone" established pursuant to KRS Chapter 154 designated Louisville and Jefferson County Enterprise Zones is exempt from the Capacity Charge imposed by MSD on new property development pursuant to Metro Codified Ordinance Section 50.48(C).

10.0 DRAINAGE SERVICE CHARGES

A system and structure of drainage service charges to be applied to all developed parcels of land within the MSD drainage service area and other drainage service fees are hereby established in accordance with the following:

10.1 Definitions

For the purpose of this Amendment, the words or phrases below shall have the following meanings:

10.1.1 **"MSD"** shall mean the Louisville and Jefferson County Metropolitan Sewer District.

10.1.2 **"Developed"** shall mean the condition of real property altered from its natural state by the addition to or construction on such property of impervious ground

cover or other man-made physical improvements such that the hydrology of the property or a portion thereof is affected.

10.1.3 An **"Equivalent Service Unit"** (ESU) is the measure of impervious ground cover for a typical single-family residential property and is used by MSD in assessing the drainage service charges for each parcel of property.

10.1.4 **"Impervious Surface"** shall mean those hard surface areas either which prevent or retard the entry of water into the soil in the manner that such water entered the soil under natural conditions pre-existent to development, or which cause water to run off the surface in greater quantities or at an increase rate of flow than that present under natural conditions pre-existent to development, including, without limitations, such surfaces as roof tops, compacted gravel, asphalt or concrete paving, driveways and parking lots, walkways, patio areas, storage areas, or other surfaces which similarly affect the natural infiltration or runoff patterns existing prior to development.

10.1.5 **"Drainage Master Plan"** shall mean the plan for managing storm drainage and surface water runoff facilities and features within MSD's drainage service area and the drainage basins therein.

10.1.6 **"Drainage Service Charge"** means the fee levied by MSD upon all developed real property within the boundaries of MSD's drainage service area as authorized by this amendment.

10.1.7 The **"System"** shall mean the entire system of flood protection and stormwater drainage and surface water runoff facilities owned or leased by MSD or over which MSD has right of use for the movement and control of storm drainage and surface water runoff, including both naturally occurring and man-made facilities.

10.1.8 **"Drainage Service Area"** shall mean all areas within Jefferson County not including Anchorage, Jeffersontown, St. Matthews and Shively, except as those areas or portions thereof are included in the district area by agreement with MSD. The term "district area" as used in this definition shall mean the service area of MSD as defined in KRS 76.005(3).

10.1.9 **"Undeveloped"** shall mean that condition of real property unaltered by the construction or addition to such property by man of impervious ground cover or physical man-made improvements of any kind which change the hydrology of the property from its natural state.

10.1.10 **"Residence"** shall mean a building or structure or portion thereof, designed for and used to provide a place of abode for human beings. The term residence includes the term "residential" and "residential unit" as referring to the type of or intended use of a building or structure.

10.1.11 **"Single-Family Residential Property or Parcel"** means any property or parcel which contains one structure with one or two residential dwelling units. Any such property or parcel containing more than one water meter, however, shall be deemed a Non-Single Family Residential Property or Parcel.

10.1.12 **"Non-Single-Family Residential Property or Parcels"** shall mean properties or parcels which contain more than one residential structure or one residential structure with more than two residential dwelling units and institutional, commercial, or industrial properties. This definition shall include a residential property or parcel containing two or more water meters.

10.1.13 **"Stormwater Quantity"** shall mean the post 100-year-24-hour storm event development flow must equal or be less than the pre-development 2-year-24-hour storm flows from the site.

10.1.14 **"Stormwater Retention or Detention Facilities**" shall mean stormwater drainage structures such as a basin, best management practice or facility that detains or retains (infiltrates) surface drainage / rainwater runoff.

10.1.15 **"Stormwater Volume"** shall be based on the capture, infiltration, and/or treatment by GMPs of a minimum of 0.6-inch of rainfall applied to impervious surfaces in the development.

10.1.16 **"Total Runoff"** shall be based on the following storm events: 3 month 24 hour; 1 year 24 hour; 5 year 24 hour; 100 year 24 hour;

10.1.17 **"Green Management Practices (GMPs)"** shall mean pervious pavement, rain gardens, green roofs, infiltration drains, wetlands, bioswales, increased green space, etc. consistent with the Green Infrastructure Design Manual. (MSD Design Manual, Chapter 18).

10.1.18 **"Water Quality Benefits"** shall be based on the threshold rain event the GMPs are able to treat through infiltration and/or pollutant removal. The GMP, or series of GMPs, must at a minimum, treat the threshold/minimum water quality rain event, as defined in the MSD design manual, imposed upon new development (ex. 0.60-inch or 1.0-inch rain event capture). Alternatively, this may include a detailed analysis performed by the property owner identifying the resultant discharge volume reduction and priority pollutant removal efficiencies.

10.1.19 **"Green Infrastructure Signage"** shall mean static green infrastructure educational signage that is installed at a credited green site, and that is designed and placed in accordance with MSD standards and guidance.

10.1.20 **"Volume Infiltrated"** shall mean the depth, in inches, of rainfall applied to the impervious surface that is captured and infiltrated by a GMP.

10.1.21 **"Connected Downspout"** shall mean the conveyance of roof drainage on private property, by pipe or other means, directly to an MSD collection system that conveys flow to a WQTC.

10.2 Service Charge

A drainage service charge is imposed on every parcel of land within the drainage service area except for the following exempted properties:

10.2.1 City-owned property where that incorporated city has entered into an interlocal drainage service agreement with MSD providing for detention basin sites,

easements, drainage rights-of-way or other assets of value comparable to applicable drainage service charges;

10.2.2 Properties owned by the Metro Government, or their budgeted agencies, which have offset their drainage service charges by the dedication of drainage facilities and future considerations through concomitant cooperative agreements;

10.2.3 MSD-owned property;

10.2.4 Public roads;

10.2.5 All undeveloped parcels of land.

The following charges are hereby established and imposed for all parcels or real property within the drainage service area, excluding exempted properties;

10.3 Class A properties or Single-Family Residential

The single-family residential charge rate shall be **$7.68** per month for each parcel having one or two residential dwelling unit(s). This flat rate fee is based on each single-family residential parcel being equal to one equivalent service unit (ESU). MSD shall determine the number of single-family residential parcels in the drainage service area and designate each as a single ESU irrespective of the size of parcel is segregated or the use of the land is modified to other than single-family. Drainage Charges may be pro-rated based on the number of actual days in a billing cycle.

10.4 Class B or other Parcels

The charge for all other parcels within the drainage service area shall be based upon the number of square feet of measured impervious surface, as determined by MSD through aerial photography and surface feature evaluation processes, expressed in whole ESUs by rounding to the next highest ESU (an ESU has been determined to be 2,500 square feet of impervious surface). The charge for Class B property may be computed by multiplying the number of ESUs for a given parcel by the unit rate established by MSD of $**7.68** per month. Drainage Charges may be pro-rated based on the number of actual days in a billing cycle. Any owner of Class B property may request a drainage charge credit adjustment for approved on-site stormwater retention or detention facilities provided:

10.4.1 The property owner remains responsible for all costs of operation and maintenance of the facility;

10.4.2 The facility has been constructed in accordance with all approved plans; “and drainage service charges” following the term “Wastewater Service Charges” whenever said term appears in said provision.

10.4.3 The owner has obtained MSD required permits for the facility; and

10.4.4 MSD has access to the facility for purposes of inspecting for compliance with design, maintenance and operating standards.

10.5 Credits-Monthly Drainage Service Credit

If MSD approves a drainage charge credit for on-site stormwater retention or detention facilities, the credit will be applied by reducing the number of billable ESUs by the percent of reduction in stormwater runoff due to such on-site facilities, as determined by MSD. The net billable ESUs after such credit is applied shall be expressed in whole ESUs by rounding to the next highest ESU. The adjusted drainage service charge shall not be less than 50% of the drainage service charge before the credit adjustment.

Applications for credits and stipends utilizing green infrastructure GMPs that exceed minimum requirements established by local ordinance and the MSD Design Manual will be reviewed to consider potential credit for peak flow rate reduction, total site runoff reduction, water quality benefit and green infrastructure outreach/education. Customers will be eligible for either a detention credit or the current MSD Drainage Credit Program, not both. The credit shall be calculated differently depending on the system to which the project drains, either the combined sewer area or MS4 area. Determination of which system the credit application applies to can occur at www.msdstormwaterquality.org. The basis for the credit computation is as follows:

Credit Computation Basis

MSD Drainage Credit Program				
	Category	Max Credit	Design Condition	Credit Allocation
MS4 Area	Stormwater Quantity	30%	2yr Post Developed Flow = (1/2) 2yr Pre Developed Flow	10%
			10yr Post Developed Flow = (1/2) 10yr Pre Developed Flow	10%
			100yr Post Developed Flow = (1/2) 100yr Pre Developed Flow	10%
	Stormwater Volume	15%	Stormwater Volume Credit = [(Volume infiltrated) * X 10%] with a maximum of credit of 15%	
			MAX Stormwater Volume	15%
	Green Infrastructure Signage	5%	Signage	5%
				50%
Combined Sewer Area	Stormwater Quantity	15%	Post Developed 100 yr Flow = Pre Developed 2 yr Flow	15%
	Stormwater Volume	30%	Stormwater Volume Credit =[((Volume Infiltrated)X 20%) -30%] with a maximum credit of 30%	
			MAX Stormwater Volume	30%
	Green Infrastructure Signage	5%	Signage	5%
				50%

Credit and stipend applications must include proposed operation, maintenance, and inspection plans. Applicants will be required to provide annual certifications documenting that the required inspections and maintenance were performed to maintain the credit. In addition, access must be granted to MSD to perform inspections for the life of the credit. Applications for a credit or stipend must also include construction plans prepared in accordance with standards defined in the MSD Design Manual. This requirement includes preparation of plans by a qualified professional.

10.6 Monthly Stormwater Drainage Service Charge Credit Duration

New credits may be granted for a maximum of 10 years provided that all requirements are met and continue to be met for the life of the credit. Approved drainage service charge credits will remain in effect for up to 10 years from the original date of the application approval. In addition, the following conditions apply to obtaining and maintaining the credit:

10.6.1 The existing facility must be maintained to acceptable condition or repairs must be made within the time prescribed by MSD.

10.6.2 MSD must be given access to enter the properties to perform inspections.

Loss of credit due to non-performance shall be permanent and irreversible after 60 days of failure to comply with notices of violations (NOVs). Subsequent applications will consider the most current credits program and shall be subject to all requirements and conditions applicable at the time the new application is made.

10.7 Capital Recovery Stipend

Capital Recovery Stipends are payments from MSD offered to defray the cost of implementing green infrastructure components that exceed minimum requirements established by local ordinance and the MSD Design Manual. Acceptance of the Capital Recovery Stipend will reduce the monthly stormwater drainage service charge credit for which the Applicant is eligible. If a Capital Recovery Stipend is accepted, the drainage service charge shall not be less than 75% (i.e. monthly drainage service charge credit shall be no more than 25%). MSD will not incur costs associated with an Applicant's engineering, design, or analysis required for completion of the application.

Stipend values will be determined by MSD utilizing hydraulic modeling of the incorporation of the green project into the Combined Sewer System. The project value will include the treatment savings cost, as well as any size reduction savings to downstream gray infrastructure as outlined in the Integrated Overflow Abatement Plan (IOAP).

Should a customer already enrolled in the program request to participate in the Capital Recovery Stipend program for either a new property or an improved property, the customer must enter into a new agreement for the new or improved property which sets forth the stipend amount that adheres to the current credit policy and must terminate any preexisting agreement pertaining to that specific property.

Capital Recovery Stipends are available on a priority basis and as MSD budgets allow. Priority will be given to potential projects based on: performance indicators, location in relation to priority sewersheds and watersheds, potential for sustainable partnerships, constructability, and public exposure potential.

Applications for Capital Recovery Stipend must be prepared by qualified professionals and must also include operation and maintenance plans, and designs prepared in accordance with standards defined in the MSD Design Manual. Annual certifications

must also be submitted by the property owner who will be required to document that inspections and maintenance needs have been performed.

Applications are required one year prior to the agreement expiration to ensure no lapse in credit. Applications will be reviewed to consider potential credit for peak flow rate reduction, total site runoff reduction, water quality benefit and green infrastructure outreach/education. The sites will be subject to access by MSD for inspection and maintenance certifications.

Capital Recovery Stipend agreements will reflect MSD's value recovery if green infrastructure GMPs are removed or altered beyond the original intent. Recovery will be required, if within 10 years of stipend agreement approval date a property owner chooses to remove the green infrastructure GMP, or make modifications that negate the intended purpose associated with a capital recovery stipend. In which case, the property owner shall be responsible for reimbursing MSD the greater of: 25% of the stipend amount; or, a straight line 10-year depreciation of the stipend amount.

As an alternative to the Capital Recovery Stipend, credit applications will be accepted to allow for reduction in impervious area by the amount controlled by green infrastructure GMPs. This credit, based on alternative impervious area calculation, will be available for a maximum of 10 years. The green infrastructure GMPs must control drainage to a level acceptable to MSD (i.e. capacity to manage the first 0.75-inches of precipitation of a storm event). These sites will also be subject to access by MSD for inspection and maintenance certifications.

For single family residential customers, incentives for disconnection of downspouts may be available at a rate of $100/downspout if the homeowner disconnects. Disconnection incentives are subject to MSD inspection and approval. Details on the program are outlined at www.msdstormwaterquality.org.

10.8 Other Drainage Fees

The Board of MSD may establish fees for the review and approval of plans or designs of drainage facilities, and for the inspection of the construction of drainage facilities, all in accordance with KRS Section 76.085, and may establish policies for the sharing of the costs of developing regional drainage systems serving multiple developments/properties.

10.9 Billing and Collection

Drainage service charges shall be billed and made payable using the same frequencies and billing cycles used by the Louisville Water Company for its billing system. The amounts to be billed shall be included as additions to the billings of the Louisville Water Company for water and/or sewer service, or by separate billings and billing cycles for accounts not maintained by the Louisville Water Company. Drainage Charges may be pro-rated based on the number of actual days in a billing cycle.

The owner(s), tenant(s) or person(s) responsible for the payment of water service charges and/or sewer service charges shall also be responsible for the payment of drainage service charges for the same parcel(s) except for multiple occupancy such as shopping centers, apartment, condominiums, etc., in which cases MSD may either allocate the drainage service charges among the occupants of the parcel or may deem that a single billing to the

parcel's owner(s), agent or association is appropriate. In either case, the billed party shall be responsible for payment of drainage service charges. For properties not billed by the Louisville Water Company for water service charges and/or sewer service charges, the owners of such properties shall be billed drainage service charges and shall be responsible for payment of same. In all situations, the owners of properties subject to drainage service charges shall be fully responsible for payment of said charges regardless of any other parties herein above identified as also being responsible for payment of drainage service charges.

When any drainage service charges remain unpaid for a period of thirty (30) days after the amount becomes due and payable, the property, tenant and the owner thereof shall be deemed delinquent until such time as the charges are fully paid. MSD may terminate or cause to be terminated public sewer, water, and/or drainage services against the tenant or owner to obtain payment, all in accordance with KRS 76.090(4). A penalty shall be applied to delinquent drainage charges in the same manner that penalties are applied to delinquent sewer and water charges by the Louisville Water Company or as otherwise determined by MSD.

10.10 Drainage Revenues/Expenses

All monies collected through drainage service charges and drainage fees authorized herein shall be separately identified and accounted for in MSD's financial records, and all expenses related to stormwater drainage and flood control shall be separately identified and accounted for by MSD.

10.11 Adjustment of Charge, Appeals

Any owner who considers that drainage service charges applied to the owner's parcel are inaccurate or otherwise disagrees with the determination may apply to MSD's Financial Director for a rate review, stating in writing the grounds for the adjustment. The Financial Director will review the case and report findings to the Executive Director. The Executive Director shall consider the complaint and staff recommendations and determine whether an adjustment is necessary to provide for reasonable and equitable application of the drainage service charge.

Appeal of decisions made by the Executive Director may be brought before the MSD Board in writing with notice and substance of the appeal sent to the Board's secretary within fifteen (15) days after the owner receives the Executive Director's decision. Upon reviewing the documentation, the Board shall render a final decision.

11.0 INFLOW AND INFILTRATION (I/I) SURCHARGE

11.1 Applicable to individuals and/or entities ("hereinafter "Developers") who provide sewer service by extension of or connection to MSD's separate sanitary sewer system:

> **$1 per gallon per day calculated by multiplying $1 times the gallons per day estimated to flow from a new development connecting to MSD's sewer system as determined by MSD, with a minimum charge of $400.00 for a single project.**

11.2 I/I fees are due and payable to MSD in full at time of the Developer's payment of Capacity Charges.

11.3 I/I fees are not applicable to the following:

11.3.1 Properties located within an area of an MSD sewershed subject to "recapture fees" but exempted from such fees as "Non-Subject Properties" pursuant to express terms and conditions of the applicable Recapture Agreement between MSD and Developer, provided the Facilities constructed pursuant to the Agreement were constructed according to MSD's Master Plan for sewering Jefferson County.

11.3.2 Properties at which I/I reduction work has been approved by MSD and performed in accordance with the MSD Capacity Assurance Program.

11.3.3 Properties which do not impact documented sanitary sewer overflows as determined by MSD, and for which a Reservation of Capacity Agreement was executed prior to August 1, 2008, and a Lateral Extension Agreement was executed prior to September 1, 2008.

11.3.4 Properties which will discharge flow directly into an MSD combined sewer and for which a separate MSD sanitary sewer is not available.

11.4 I/I surcharge fees will terminate at such time MSD terminates its Capacity Assurance Program.

12.0 RECAPUTURE AGREEMENTS

MSD may negotiate and execute agreements with individuals and/or entities (herein "Developers") whereby Developers may construct and pay for regional sanitary sewer facilities that serve the Developers' property and other property located within a region determined by MSD (herein "Sewershed"). The Developer must submit plans for the proposed regional sanitary sewer facilities (herein "Facilities") to MSD and MSD must approve such plans prior to construction. The Developer also must receive approval from MSD that the Facilities' construction was in accordance with its prior approved plans and specifications. Developers must transfer right, title and interest of said Facilities to MSD at no cost. When other properties within the Sewershed are developed, MSD may charge customers located within that determined Sewershed, or other customers permitted by MSD to use such Facilities, Recapture Fees on behalf of the Developers in order to recapture the cost expended by the Developers in constructing such Facilities. MSD will calculate the Recapture Fees by determining the number of developable lots within the Sewershed and dividing it into the total final cost of the Facilities. MSD will collect the Recapture Fees and, after retaining a reasonable administrative fee from the Recapture Fees, remit the balance of the Recapture Fees to the Developers in accordance with the terms of the agreements and with this section.

13.0 SENIOR CITIZENS DISCOUNT

Senior Citizens are eligible for a 30% discount off wastewater service charges, wastewater volume charges and the EPA Consent Decree Surcharge. This discount will be made available to customers of MSD that are 65 years or older, have a gross household income of $35,000 or less, and are the primary titleholder or leaseholder on the property subject to the bill. An application will be sent to those customers that request one and the discount shall begin on the billing period

following the date that the application is approved by MSD. In order to qualify for this discount, proof of age such as a birth certificate or driver's license must be provided. In addition, proof of income such as a Federal Income Tax Form 1040 must be provided and proof of residency such as a warranty deed or lease agreement must be provided. Customers that qualify for this discount may be asked to complete a renewal application on an annual basis or as otherwise determined by MSD.

14.0 ADJUSTMENT OF CHARGES AND APPEALS

Any owner who considers that wastewater or drainage charges applied to the owner's parcel are inaccurate or otherwise disagrees with the determination may apply to MSD's Financial Director for a rate review, stating in writing the grounds for the adjustment. The Financial Director will review the case and report findings to the Executive Director. The Executive Director shall consider the complaint and staff recommendations and determine whether an adjustment is necessary to provide for reasonable and equitable application of the charge(s).

Appeal of decisions made by the Executive Director may be brought before the MSD Board in writing with notice and substance of the appeal sent to the Board's secretary within fifteen (15) days after the owner receives the Executive Director's decision. Upon reviewing the documentation, the Board shall render a final decision.

In the event of a billing error, MSD may back bill the customer for a period of two years from the date the error was discovered and MSD will grant refunds for overbillings for a period of two years from the date it was notified of the overbilling.

14.1 Severability

If any section, clause or provision of this amendment be declared by the courts to be invalid, the same shall not affect the validity of the amendment as a whole or any part thereof, other than the part so declared to be invalid.