Louisville and Jefferson County System Capacity Assurance Plan (SCAP)

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Acronyms & Abbreviations

ADF	Average Daily Flow
CFR	Code of Federal Regulations
CIP	Capital Improvement Program
CMOM	Capacity, Management, Operations, and Maintenance
CS	Collection System
CSO	Combined Sewer Overflow
EPA	Environmental Protection Agency
FEMA	Federal Emergency Management Agency
GIS	Geographic Information System
GPD	Gallons Per Day
I/I	Inflow and Infiltration
IMS	Information Management System
KDOW	Kentucky Division of Water
KPDES	Kentucky Pollutant Discharge Elimination System
LOJIC	Louisville/Jefferson County Information Consortium
MGD	Million Gallons Per Day
MSD	Louisville and Jefferson County Metropolitan Sewer District
O&M	Operations and Maintenance
SCAP	System Capacity Assurance Plan
SOP	Standard Operating Procedure
SSES	Sanitary Sewer Evaluation Study
SSO	Sanitary Sewer Overflow
Project WIN	Waterway Improvements Now
WTP	Wastewater Treatment Plant
WWP	Wet Weather Plan

Definitions

Average Daily Flow (ADF) – This is the average daily flow at a wastewater treatment plant calculated using daily flow records from a 2-year window of wastewater treatment plant influent flow data.

Credit Catchment – Defined area of the sewer system where capacity assurance credits are tracked for the Credit Banking System.

InfoWorks Collection Systems (CS) – hydraulic modeling software developed by Wallingford Software used by MSD for collection system modeling.

MSD Development Team – The department within MSD's Engineering Division responsible for reviewing and approving new development plans and requests for sewer system capacity.

Peak Wet Weather Flow – The anticipated, calculated, or monitored maximum flow within the sewer system during an actual or synthetic rainfall event.

Surcharge – The condition within the sewer when the hydraulic grade line (water surface level) within the sewer system exceeds the crown of pipe elevation.

Modeling and Flow Monitoring Basins

BB—Buechel Branch
CC—Cedar Creek
FF—Floyds Fork
HC—Hite Creek
HP—Hikes Point
JT—Jeffersontown
MC—Mill Creek
MF—Middle Fork Beargrass Creek
ND—Northern Ditch
ORFM—Ohio River Forman
PC—Pond Creek

Regional Wastewater Treatment Plant (WTP)

CCWTP—Cedar Creek WTP
FFWTP—Floyds Fork WTP
HCWTP—Hite Creek WTP
JTWTP—Jeffersontown WTP
MFWTP—Morris Forman WTP
WCWTP—West County WTP

EXECUTIVE SUMMARY

In areas of Louisville Metro with separate sanitary sewers, sanitary sewer overflows (SSOs) occur because of aged pipes that leak when the system is overloaded from rainfall or due to illicit connections to the sanitary sewer system such as sump pumps, roof drains, and foundation drains. Although new connections do not contribute to the root causes identified for sanitary sewer overflows, they do contribute additional flow that utilizes available capacity in the system. Since capacity deficiencies have been identified as the cause for a significant portion of wet weather overflows, it is important for Louisville and Jefferson County Metropolitan Sewer District (MSD) to have a program to ensure new connections do not cause or contribute to sanitary sewer overflows.

In accordance with U. S. Environmental Protection Agency (EPA) requirements, MSD developed a Capacity, Management, Operations and Maintenance (CMOM) program in May 2006. MSD's CMOM Self-Assessment was conducted in an approach that exceeds the requirements of Paragraph 23(c) of the Kentucky Division of Water (KDOW) and EPA Region 4 August 12, 2005 Consent Decree.

The overall goal of the CMOM Self-Assessment Report was to determine if there are MSD programs or activities that should be recommended for improvement to enhance service or compliance performance and to recommend specific actions and an implementation schedule to complete the recommended improvements. Paragraph 23c of the Consent Decree listed nine areas to be emphasized in the CMOM Self-Assessment.

In Subsection 4.2, the CMOM Self-Assessment outlined an evaluation of MSD's Programs in nine major categories, one of which being system capacity.

CMOM states in subsection 4.2.4.2 that the System Capacity Assurance Program (SCAP) objective will be the basis to coordinate capacity decision criteria to support each watershed's community values. The process should include a programmatic approach for items such as: confirming capacity of wastewater treatment plants (WTP), pump stations, and conveyance system; identifying hydraulic constrictions; and proposing capacity improvements that support interim and Wet Weather Plan (WWP) performance objectives.

The capacity assurance process applies to the separate sanitary sewer system and does not

include the combined sewer areas. Capacity within the combined sewer areas will be addressed from a surface storm water perspective through updates to the MSD Design Manual, currently underway. In addition, the SCAP only provides protocols and procedures for certifying or providing adequate peak wet weather capacity. Protocols and procedures for providing average daily flow (ADF) capacity are not covered within the SCAP.

In Section 4.2.7.1 CMOM states that MSD has procedures and policies that minimize the volume of untreated wastewater transmitted to affected portions of the collection system. However, the majority of the system areas cannot accommodate an increase in capacity or are not configured to accommodate a large diversion.

Required improvements to the sewer system to accommodate system capacity may take years to implement. While these improvements are being implemented, developers, individual homeowners, and other entities are making requests for additional flows to the system. The CMOM Self-assessment specifies that MSD must respond to these requests for new connection to the sewer system or increases in flow from existing connections through a SCAP.

The objective of the SCAP is to enable MSD to authorize new sewer service connections or increases in flow from existing sewer service connections while making system improvements in accordance with the May 2006 CMOM recommendations. Detailed in the SCAP is how MSD will assess the peak flow capacity of all major system components (collector sewers, interceptor sewers, treatment plants and pump stations). SCAP also outlines how requests for increased flow to the collection system will be compared to the peak flow capacity components.

Additionally, when MSD is unable to certify capacity of the major system components downstream of the proposed flow addition, it may authorize the additional flow through a system of banked flow credits. This banking system requires that for every one gallon of new flow three gallons of inflow and infiltration (I/I) must be removed from the system. A presumptive approach to this removal is outlined within this document, similar to the approach taken by similar communities that have draft SCAPs.

The SCAP is a living, dynamic document and will continue to change due to various components including modeling improvements, map updates, Consent Decree program implementation, reporting automation, capital improvement projects, capacity requests, and other CMOM and MSD programs.

Organization of Report

This SCAP report is organized into six sections as listed below. Each of the sections is described in terms of the CMOM Recommendations. A summary of the sections follows:

Section 1 provides an introduction to Louisville Metro's sewer system, the SCAP purpose and goals, and an overview of MSD's information management system (IMS).

Section 2 provides a description of the existing capacity in the collection system and the protocols for the treatment facilities, pump stations, and conveyance zones. Section 2 also establishes capacity assessment protocols for all treatment facilities and pump stations. The focuses of Section 2 are the May 2006 CMOM recommendations in Table 4.2: M-E-6 - Major Facility Capacity, and M-E-7 - Facility Capacity Protocol.

Section 3 details the current, committed, and proposed flow methodology for system capacity. The section focuses on the May 2006 CMOM recommendations in Table 4.2 M-E-8 Current and Committed Capacity and M-E-9 Build-out Capacity (due September 2008). This section confirms sewershed boundaries, establishes existing base flow and wet weather flow, and identifies a systematic process to determine current capacity limitations and the ability for the system to receive new flow.

Section 4 describes a step-by-step process for situations when the system cannot receive new flow. The Capacity Certification Determination Procedures addresses how credits could apply and Credit Banking Procedures.

Section 5 documents the system capacity standard procedures and focuses on the May 2006 CMOM recommendations in Table 4.2: M-E-10 - Available Capacity Standard Operations Procedures (SOP). This section outlines standard procedures for determining available flow credit, the estimated reduction of flow capacity from corrective actions, calculating credit, and an overview of various rehabilitation projects.

Section 6 summarizes the implementation and schedule for SCAP. Implementation includes a process to regularly review and update the capacity of operating assets, the current, committed, and projected loads, and a schedule to regularly identify current or projected capacity problems, identify capacity improvement projects, and to improve the tracking and reporting capabilities of the program for capacity and credits.

SECTION 1 INTRODUCTION AND SYSTEM CAPACITY OVERVIEW

1.1 INTRODUCTION

Louisville Metro has over 3,200 miles of sewer, approximately 500 miles being over 100 years old. Currently, MSD serves 220,000 customer accounts and 693,000 people. The collection system operated and maintained by MSD includes:

- 6 regional wastewater treatment facilities
- 16 small wastewater treatment plants
- Approximately 300 pumping stations
- Ohio River Flood Protection System, including 16 flood pumping stations and 29 miles of floodwall

In areas of Louisville Metro with separate sanitary sewers, sanitary sewer overflows (SSO) occur because of aged pipes that leak when the system is overloaded from rainfall or due to illicit connections of sump pumps, roof drains, or foundation drains to the sanitary sewer system.

The Louisville Metro combined sewer system was built from the 1860s to the 1950s. Currently, there are 111 active combined system overflow (CSO) locations and on average will overflow 30 times per year. Additionally, during a year with above average rainfall, over 100 locations in the separate sanitary sewer system could overflow.

MSD has been pro-active and initiated a Wet Weather Abatement Program in 1989. The first goal was to identify potential overflow points in the combined sewers and in the fast growing sanitary sewer system. Both CSOs and SSOs occur most often during prolonged rain storms. On the wettest days, millions of gallons of diluted sewage are discharged to local streams.

MSD's Wet Weather Abatement plan included these measures:

- Adding storage basins to the combined sewer system
- Cleaning sewers of excess sand, gravel and mud to increase carrying capacity
- Removing unnecessary clean-water connections (downspouts and sump pumps)
- Repairing sewer leaks that allow groundwater into the sewer system

System capacity assurance is an important component of MSD’s Project WIN (Waterway Improvements Now) initiative. Project WIN was initiated to address the challenges of improving

Louisville's water quality. To meet these challenges, MSD has embarked on a comprehensive sewer improvement program that will eliminate major sources of water pollution throughout Louisville Metro. MSD has already completed more than $1.4 billion in capital expansion and upgrades to wastewater and stormwater facilities, some of these accomplishments include:

- Reduced 300 sewer overflow points in the combined and separate systems
- Installed solids and floatable controls at nearly all Combined Sewer Overflow (CSO) locations
- Separated 66,000 linear feet of combined sewers
- Eliminated 44,000 septic tanks
- Eliminated 275 small plants and pumping stations
- Built and expanded regional wastewater treatment facilities

1.2 SCAP PURPOSE

The SCAP will be the basis for coordinating capacity decision criteria for each sewershed within the separate sanitary system. Providing wastewater collection, conveyance, and treatment that meet the expansion needs of MSD's customers, while protecting the environment and meeting regulatory requirements, are top priorities of MSD's facility improvements efforts.

Because of existing concerns about wet weather capacity and the time it will take to implement a complete Capital Improvement Program (CIP), there is concern about the addition of new flows to the system. The objective of the SCAP is to enable MSD to authorize new sewer service connections or increases in flow from existing sewer service connections while making system improvements in accordance with the May 2006 CMOM recommendations.

The capacity assurance process applies to the separate sanitary system and does not include the combined sewer areas. The combined sewer areas will be addressed from a surface storm water perspective through updates to the MSD Design Manual currently underway.

The SCAP process includes a programmatic approach for items such as confirming capacity of plants, pump stations, and conveyance system; identifying hydraulic constrictions; and proposing capacity improvements that support interim and WTP performance objectives. The protocols and procedures for providing adequate average daily flow (ADF) capacity are not

covered within this plan.

Moreover, the SCAP contains technical information, methodology, and analytical techniques to be used to:

- Calculate the peak flow capacity of system components;
- Calculate the increase in peak flows from new service connections;
- Calculate the increase in peak flow capacity resulting from specific system improvements projects;
- Integrate SCAP with current new development approvals, acquisition of sewers, and extension of service to un-sewered areas;
- Determine available flow credits and estimation of flow reductions from corrective actions.

1.3 CAPACITY ASSURANCE INFORMATION MANAGEMENT

The protocols and procedures described within the SCAP require a significant amount of data. Tracking this data and automating processes is vital to the success of the capacity assurance program.

The capacity assurance program utilizes MSD's current information management system (IMS), housed within Hansen, and the Louisville/Jefferson County Information Consortium (LOJIC) Geographical Information System (GIS) to track data and automate the processes outlined within the SCAP. MSD currently uses the IMS to track existing, committed, and proposed flows as well as facilities and assets, capital projects, corrective actions (work orders), overflows and system deficiencies, and numerous other data sets relevant to system capacity.

The current IMS will be utilized to track system capacity and new capacity credits. Staff will develop additional datasets as the SCAP is implemented in combination with the existing databases. Tools within the IMS will also be utilized for a credit banking system as described in Section 4 to track both earned credits from specific rehabilitation and capital improvement projects, and credit expenditures on approved increases in wastewater flows. Data from the InfoWorks CS hydraulic modeling results will also be housed within the IMS and will be used to create GIS layers for displaying current system capacity and automating approval processes. The following is a list of the major datasets that will be tracked and housed within the IMS.

- Hydraulic modeling results
- Sewer system monitoring data
- Designed, measured, and calculated capacities for sanitary sewer system assets
- Approved, committed, and pending requests for capacity
- Certification and approval documentation
- Sewer rehabilitation projects
- Capacity credits accounting system

SECTION 2 SYSTEM CAPACITY PROTOCOL

2.1 FACILITY CAPACITY PROTOCOL

Although new sewer connections do not contribute to the root causes identified for sanitary sewer overflows (SSO), they do contribute additional flow that utilizes available capacity within the system. Since capacity deficiencies have been identified as the cause for a significant portion of wet weather overflows, it is important for MSD to have a program to ensure new connections do not cause or contribute to sanitary sewer overflows.

The facility protocol for capacity assessments are outlined in this section. Also outlined is the protocol for determining the current peak wet weather capacities for the wastewater collection system, pump stations and force mains, and the wastewater treatment plants (WTPs). The methods, as well as the data limitations, are discussed for each of the three system elements.

2.2 SYSTEM CAPACITY MODELING

To analyze sewer system capacity, many complex factors must be evaluated for each type of facility within a collection system under many different scenarios. To accomplish this task, MSD has developed hydraulic models for the entire service area using InfoWorks CS modeling software. The sewer system models contain pump stations, hydraulic structures, interceptors, and collector sewers[1] within the MSD service area.

The hydraulic models were developed using LOJIC GIS data, historical hydraulic models, as-built record drawings, survey data, and field data. The models were calibrated and validated using flow monitoring and rainfall data collected between January and June of 2007. Within the flow monitoring period, dry weather periods were used to develop average daily user flows while wet weather events were used to analyze collection system response to wet weather and to determine the impacts of inflow and infiltration (I/I).

For the purposes of the SCAP, the 2-year 3-hour cloudburst[2] storm event was chosen to

[1] For the separate sanitary sewer system all collector sewers 8-inch in diameter or larger were included in the hydraulic models. For the combined sewer system all sewers 18-inch and larger were included.

[2] A cloudburst event analysis for the Louisville area was developed using a statistical analysis of historical rainfall data using the methods explained in NOAA Atlas 14. This analysis also developed a typical storm distribution and duration (3 hours) for the Louisville area.

analyze system capacity. To accomplish this, a 1.82 inch rainfall with the cloudburst storm event distribution was applied to the InfoWorks CS hydraulic models to evaluate system capacity. These model runs serve as the basis for current sewer system capacity. The following describes how the modeling data will be used to evaluate capacity at each facility within MSD's sanitary sewer collection system.

2.3 WASTEWATER TREATMENT PLANTS (WTP) CAPACITY PROTOCOL

Certification of adequate treatment plant capacity confirms that at the time the WTP receives the proposed increased flow, the WTP is in compliance for quarterly reporting, and that the new or increased flow will not result in bypasses or diversions prohibited by the National Pollutant Discharge Elimination System (NPDES) permits. Current peak treatment capacities and average daily flow (ADF) limits for MSD's six regional WTPs and 16 small WTPs have been established. Wet weather capacity at each treatment plant was determined using design data. ADF limits are established within each WTP's current permit.

The existing wet weather flow at each WTP was calculated using the hydraulic models with the peak design wet weather capacities coded into the model. For the purposes of the SCAP, a WTP is determined to be at peak wet weather capacity when the hydraulic model shows a surcharge condition at the influent pump station or at manholes along the main interceptor leading to the treatment plant. A surcharge condition is defined as a water surface level less than two (2) feet from the top of the influent pump station wetwell or at a manhole (MH) rim along the main interceptor leading to the WTP.

Current ADF is determined by calculating using a 2-year window of WTP influent flow data. This 2-year window of data is updated annually in January. Between the updates, committed and requested capacity from new flow customers are tracked within a database using an estimated flow of 290 GPD per single-family equivalent. A WTP is considered to be at ADF capacity when the calculated ADF plus the committed capacity equals or exceeds the permitted ADF. MSD also uses this ADF data for future flow forecasting and planning of WTP upgrades.

Appendix B lists the current WTP capacities, which will be reviewed annually, and updated to evaluate capacity and report evaluation updates.

2.4 WASTEWATER COLLECTION CAPACITY PROTOCOL

Certification of adequate collection capacity confirms that each gravity sewer through which the proposed additional flow will pass has the adequate capacity to convey both the existing and proposed peak wet weather flows from all new or existing service connections, without causing a surcharge condition.

The existing wet weather peak is calculated from the 2-year 3-hour cloudburst storm simulation within the InfoWorks CS hydraulic models. The models indicate areas of surcharging during the design storm simulation. For the purposes of the SCAP, a wet weather surcharge condition is defined as a water surface level within the sewer that is less than two (2) feet from the manhole rim elevation. If the sewer system is in an area of significant backup complaints then a surcharge condition is considered to be a water surface level within five (5) feet of the manhole rim. However, if MSD has, pursuant to the SCAP, identified pipe segments or manholes designed to operate under a pressure condition (such as siphons), then the capacity of these pipe segments or manholes shall be evaluated based on their design criteria.

Table 2.1 - Collection System Surcharge Condition Criteria

Collection System Area	Surcharge Condition Criteria
Area of Limited or No Backup Complaints	Sewer Hydraulic Gradeline within 2’ of MH Rim
Area of Significant Backup Complaints	Sewer Hydraulic Gradeline within 5’ of MH Rim
Siphon or Other Unique Structure	Evaluate Based on Design Criteria

The protocols and procedures for providing adequate ADF capacity within the collection system are not addressed within the SCAP. If adequate capacity to convey the ADF is not available, the developer and MSD’s Development Team must determine the measures needed to provide adequate ADF capacity for the proposed additional flow.

2.5 PUMP STATION AND FORCE MAIN CAPACITY PROTOCOL

Certification of adequate pump station and force main capacity confirms that each pump station and associated force main has the capacity to transmit the existing peak wet weather flow plus the proposed peak wet weather flow without causing a surcharge condition at the pump station or within the collection system served by the pump station.

The existing peak wet weather flow at each pump station is calculated and evaluated using the 2-year 3-hour cloudburst storm simulation within the InfoWorks CS hydraulic models. The hydraulic models contain information on all MSD operated pump stations and force mains, which was gathered through a combination of capacity measurements, run time analysis, and design data reviews. Using the hydraulic models to simulate pump station and force main capacity provides MSD with a tool to dynamically evaluate all the factors associated with a pump station's capacity, such as, wet well and collection system storage, multiple pump configurations, and timing of peak wet weather flows.

Because capacity measurements are the most accurate and up-to-date information that can be obtained for pump stations, MSD has begun performing capacity measurements at all pump stations. Currently MSD has performed capacity measurements at over half of all pump stations and MSD is in the process of completing measurements on the remaining stations. For the stations yet to be measured, a combination of pump station runtime records and pump curve design data were used to determine the pump station capacity for use in hydraulic modeling.

For the purposes of the SCAP, a wet weather surcharge condition at a pump station is defined as water surface level less than two (2) feet from the top of the pump station wetwell or at any manhole rim within the upstream collection system served by the pump station. If the collection system served by the pump station is in an area of significant backup complaints, then a surcharge condition is considered a water surface level within five (5) feet of the top of the wetwell or at any manhole rim within the upstream collection system served by the pump station.

Table 2.3 – Pump Station Surcharge Condition Criteria

Pump Station Service Area	Surcharge Condition Criteria
Area of Limited or No Backup Complaints	Sewer hydraulic gradeline within 2' of top of wetwell or upstream MH rim
Area of Significant Backup Complaints	Sewer hydraulic gradeline within 5' of top of wetwell or upstream MH rim

The protocols and procedures for providing adequate ADF capacity at pump stations are not addressed within the SCAP. If adequate capacity to convey the ADF is not available, the developer and MSD's Development Team must determine the measures needed to provide

adequate ADF capacity for the proposed additional flow.

For pump stations with unique designs, functions, or setups, such as, combination flood and sanitary stations, specific capacity conditions may apply that fall outside of the pump station and force main capacity protocols outlined in this section. Capacity at these facilities will be determined based on factors most applicable to each unique situation.

SECTION 3 CAPACITY CERTIFICATION DETERMINATION PROCEDURES

3.1 CAPACITY CERTIFICATION OVERVIEW

The objective of capacity certification is to ensure that system capacity is available beginning from the new flow location through the entire system to the WTP. In order to certify capacity, the system must be analyzed based on whether the flow is current, committed, or requested. This section defines how each of these flows is determined, calculated, and tracked. Additionally, a step-by-step process is described and a for ensuring capacity is available within the system from the new flow location to the WTP.

3.2 CURRENT, COMMITTED, AND REQUESTED CAPACITY

There are three levels of system capacity that must be analyzed in order to certify that capacity for a new flow request is available. These levels of system capacity are current capacity, committed capacity, and requested capacity. Each of these three capacity scenarios are defined as follows.

Current Capacity – The capacity of the existing system without any new flow. As explained in Section 2, current capacity has been determined from the InfoWorks CS hydraulic models and system monitoring data. To ensure the data remains current, capacity will be calculated on a periodic basis.

Committed Capacity – The sum of new flows from all approved new developments, capital projects, sewer acquisitions, and sewer assessment projects. Committed ADFs are based on 290 gallons per day (GPD) times the number of equivalent single-family dwelling units for ADF. Peak wet weather flows are determined by multiplying the MSD Design Standard peaking factor, which ranges from 2.5 to 5.0, by the calculated ADF. Currently, approved capacity requests are tracked within the Hansen IMS system for use by the Development Team to determine current committed system capacity.

Requested Capacity – The sum of all current capacity requests pending MSD's approval. All capacity requests (or LE requests) are reviewed on a routine basis by MSD LE review staff within the Development Team. Flows from pending capacity requests are also calculated using 290 GPD as explained for committed capacity. Currently, pending

capacity requests are tracked within the Hansen IMS system and are used by the Development Team to determine current requested capacity.

The sum of current, committed, and requested capacity is tracked within each WTP sewershed for use in reviewing each new capacity request.

3.3 MSD SYSTEM CAPACITY ASSURANCE PROCESS

A system capacity assurance process assures that the sanitary sewer system has capacity for new flow. MSD has developed a step-by-step approach that ensures that before new flow is added to the system, the existing capacity from the new flow location is assessed.

Figure 3-1 shows the MSD System Capacity Assurance Process diagram. The systematic approach in Figure 3.1 addresses new flows from development and redevelopment, capital projects, sewer assessment projects, sewer acquisition, and any other project that will add or change flow to a WTP sewershed.

3.3.1 Step-By-Step System Capacity Process

The description of the capacity process outlined below references the numbered steps in Figure 3-1. The capacity assurance process applies to the separate sanitary system and does not include the combined sewer areas. The combined sewer areas will be addressed from a surface storm water perspective through updates to the MSD Design Manual currently underway.

The purpose of the SCAP process is to determine the available capacity of the system to convey average daily flows (ADF) as well as the peak wet weather flows. MSD requires that the new flow customer calculate ADF and peak design flow for the proposed development. If the system does not have the capacity to convey the ADF then the new flow customer must coordinate with MSD to remedy the capacity issues. It will be the new flow customer's responsibility to resolve the average daily flow capacity deficiency.

STEP – 1 - New Development Lateral Extensions (LE) & MSD Capital Projects Submittal Review

MSD has a lateral extension (LE) process that develops a procedure for new development (and

redevelopment) to add flow to the existing system. The LE process requires the requester to submit capacity calculations for each new development.

The standard capacity request form, entitled "Downstream Facility Capacity Request" (attached as Appendix C), is used to ensure all relevant information is submitted to MSD in order to evaluate the capacity requirements of the proposed development. Information includes the projected flow based on the size of the proposed development, where the new flow will tie into the existing system, and which downstream facilities the new flow will pass through.

Currently, when the Downstream Facility Capacity request form is submitted, a team of MSD staff members from Engineering, Regulatory Services, and Metro Operations reviews the request during a regularly scheduled weekly meeting. The cross-functional review team identifies potential capacity problems and investigates information available on the design/storm facilities to determine if capacity is available or if the system is stressed under wet weather conditions.

STEP 2 - **Does The System Have The Capacity To Convey The Average Daily Flow?**

The capacity assurance process described in the SCAP is focused on the peak wet weather, as well as, the ADF issues of the separate sanitary sewer system. Therefore, the initial check of the system should involve a review of the average daily capacity of the system downstream of the new flow location. If the system has the capacity to convey the ADF, proceed to Step 3. If the system does not have the capacity to convey the ADF, proceed to Step 8.

STEP 3 – Does The Wastewater Treatment Plant Have Adequate Capacity To Treat The Average Daily Flow and the Peak Wet Weather Flow?

Check the WTP capacity for the new flow in the sewershed using the Treatment Plant Capacity Data within the Hansen IMS system. If WTP does have capacity, proceed to Step 4. If WTP does not have capacity, proceed to Step 9.

STEP 4 - Is the New Flow Upstream of a Documented Overflow?

Using the most recent version of the documented overflow data, identify all downstream documented overflow locations. If there are no documented overflow locations downstream from the proposed new flow, proceed to Step 5. If there are documented overflow locations

downstream, proceed to Step 10.

STEP 5 - Are Any Downstream Segments in a Surcharge Condition?

If no downstream sewers are in a surcharge condition, then proceed to Step 6. If any segments downstream of the new flow location are in a surcharge condition, as defined in Section 2 and determined by the InfoWorks CS hydraulic modeling, then proceed to Step 10.

STEP 6 - Is Pump Station Transmission Capacity Adequate?

Check each pump station that the new flow will pass through to certify transmission capacity is available. The IMS contains data on each pump station from the hydraulic models. If downstream pump stations do have capacity, proceed to Step 7. If downstream pump stations do not have capacity, proceed to Step 10.

STEP 7 - Certify Capacity (Collection, Pumping & Treatment)

If steps 1 through 6 are satisfied, then capacity is certified and the new flow customer is notified the requested capacity has been reserved for the proposed new flow. As a result, the committed flow database within IMS will be updated with the new flow. A capacity assurance fee will be required.

Special Note: Steps 3 through 7 represent a process of capacity assessment tracking that will be repeated for every new flow request. The IMS will account for all new flows as well as current and committed capacity. The hydraulic modeling that forms the foundation of the current capacity data will be reviewed on a periodic basis and will incorporate all committed capacity when updated to keep accurate records of current capacity. The ongoing process of checking each new flow will be a routine process using the IMS and will not require new hydraulic model runs for each new capacity request.

STEP 8 - Deny Request - New Flow Customer Must Coordinate With MSD to Remedy the ADF Capacity Issues

If MSD finds that the dry weather flow capacity is insufficient, then the new flow customer must coordinate with MSD to determine potential methods to address the system deficiency.

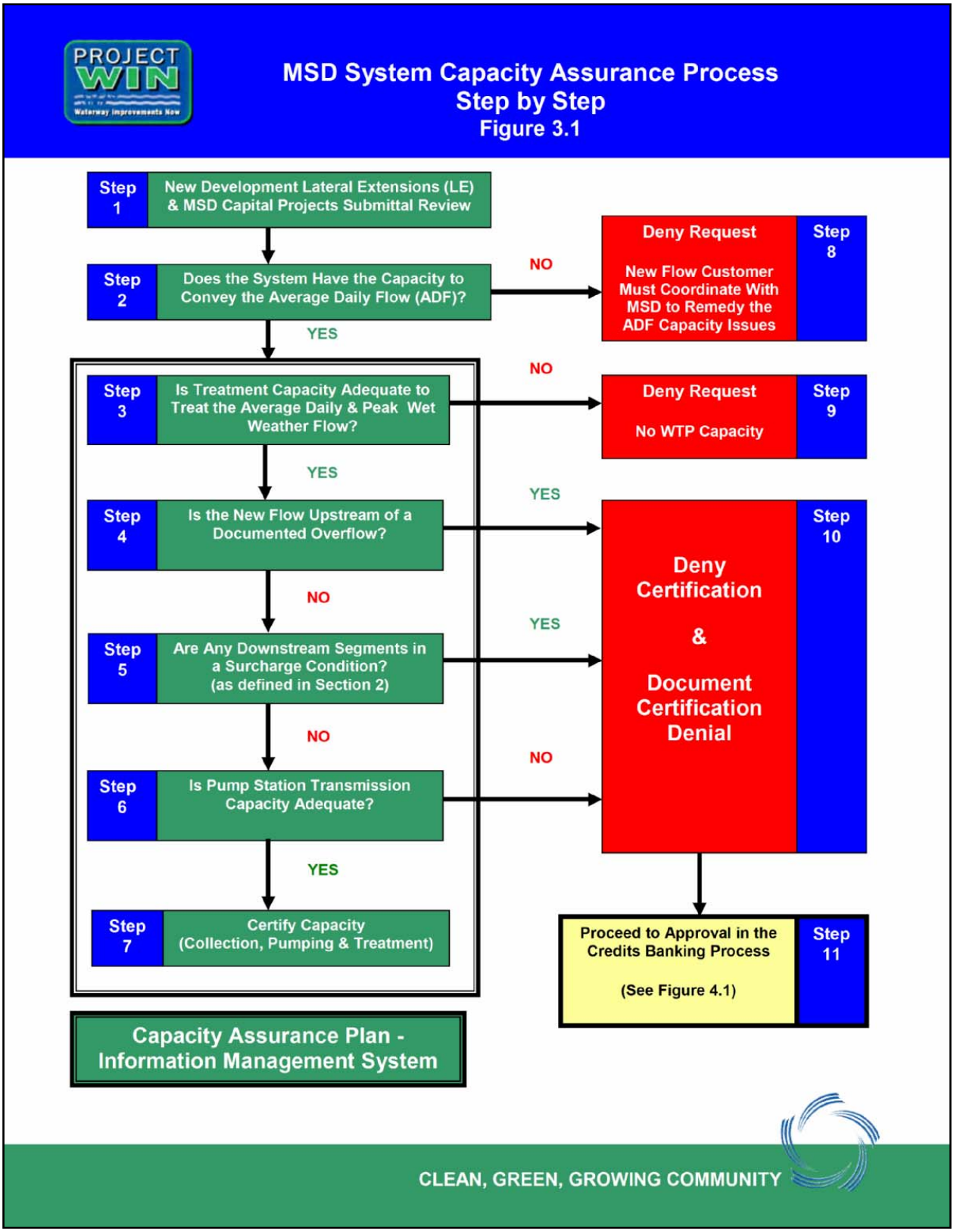
STEP 9 - Deny Request Due to Lack of WTP Capacity – If the WTP capacity is not adequate, then the new flow request is denied. Once WTP capacity becomes available then the new flow customer must resubmit the capacity request.

STEP 10 - Deny Certification & Document Certification Denial

If adequate capacity cannot be certified, MSD documents the reason capacity certification was denied. Proceed to Step 11.

STEP 11 - Proceed to Approval in Credits Banking Process

If adequate capacity cannot be certified, proceed to Approval in Credits Banking Process described in Section 4 and reference Figure 4.1.


PROJECT WIN
Waterway improvements Now
MSD System Capacity Assurance Process
Step by Step
Figure 3.1
Step 1
New Development Lateral Extensions (LE) & MSD Capital Projects Submittal Review
Step 2
Does the System Have the Capacity to Convey the Average Daily Flow (ADF)?
NO
Deny Request
New Flow Customer Must Coordinate With MSD to Remedy the ADF Capacity Issues
Step 8
YES
Step 3
Is Treatment Capacity Adequate to Treat the Average Daily & Peak Wet Weather Flow?
NO
Deny Request
No WTP Capacity
Step 9
YES
Step 4
Is the New Flow Upstream of a Documented Overflow?
YES
NO
Step 5
Are Any Downstream Segments in a Surcharge Condition? (as defined in Section 2)
YES
NO
Step 6
Is Pump Station Transmission Capacity Adequate?
NO
YES
Step 7
Certify Capacity (Collection, Pumping & Treatment)
Deny Certification & Document Certification Denial
Step 10
Proceed to Approval in the Credits Banking Process
(See Figure 4.1)
Step 11
Capacity Assurance Plan - Information Management System
CLEAN, GREEN, GROWING COMMUNITY

3.4 CAPACITY ASSURANCE FEE

MSD may establish a fee to be paid relative to rehabilitation of the sewer system or the disconnection of illicit connections. This capacity assurance fee will partially support a district-wide rehabilitation program to be managed and further financed by MSD along with contributions from developers.

The capacity assurance fees will be used to perform rehabilitation work in areas of the separate sanitary sewer system with limited capacity. For every one gallon of new flow three gallons of I/I removal will be required in areas where capacity cannot be certified. This 3:1 offset means that for every gallon of new flow requested to the system three gallons of capacity must be created within the defined credit catchment to offset the new flow.

3.4.1 IMS, Maps, And GIS Layers

The Capacity Assurance Process will require utilization of the LOJIC GIS and the Hansen IMS system to store, track, and analyze data related to system capacity. MSD has established GIS layers and databases that include:

- Documented SSOs
- Sanitary Sewer Collection lines
- Pump Station and Transmission Components
- Wastewater Treatment Plants
- System Monitoring Locations
- Sewershed Boundaries
- Hydraulic Modeling Results

Establishing protocols for the major facilities allows MSD to develop a process to use current and committed flow data to develop sewershed maps that confirm capacity. As a result, three zones are identified for new connection consideration.

Red zone – No new connections will be allowed. The red zones are areas where current and committed flows exceed the ADF capacity of the WTP, pump station or collection system.

Yellow zone – New connections will be allowed contingent on system rehabilitation to reduce overall wet weather peaks. Yellow zones are areas that have ADF capacity, however,

documented overflows or capacity restrictions from peak wet weather modeling results exist. The Yellow zones represent areas where the Credit Banking System will be used to allow new flow connections.

Green zone – New connections allowed without any credits or rehabilitation requirements. Green zone areas are defined by available ADF capacity and peak wet weather capacity with no documented overflows and no capacity restrictions identified by hydraulic modeling.

3.4.2 New Flow Review Documentation

As MSD's Develop Team reviews each new flow request, the IMS will be utilized to document the capacity assurance process and record the pertinent information from the review. In addition, databases within the IMS will document the new flow customers' location, system capacity requirements, as well as the capacity of the WTPs, pump stations, and the collection system downstream. When new flows cannot be conveyed by the system, the IMS will track which area of the system is deficient and what action is needed to approve new flow request.

3.5 APPROVAL CREDITS BANKING CERTIFICATION

Under Certification of Capacity, MSD may authorize the contribution of additional flow to the system only after it certifies that there is adequate collection capacity, transmission capacity, and treatment plant capacity.

Based on the evaluations of the collection, transmission, and treatment plant capacity that have taken place to-date, it is anticipated that initially, many locations within MSD's system will not meet the SCAP certification requirements. This means that MSD will authorize those capacity requests via the Approval of Credit Banking Procedure.

3.5.1 Credit Banking System

MSD may authorize additional flow to the system using a credit banking system. As MSD completes capital or infrastructure projects that restore capacity by reducing peak wet weather flows or constructing additional capacity, then MSD will acquire flow credits.

MSD will bank credits upon completion of specific projects sewer rehabilitation projects that add sewer capacity by reducing peak wet weather flows to the collection system. One GPD of credit

will be given for each GPD of peak flow removed or gallon of capacity added. Credits will be used to approve new capacity requests using a ratio of three capacity credits per one gallon of new flow (3:1).

As an example, if a project reduces peak flow by 1,000 GPD then a credit of 1,000 GPD will be given. If the estimated flow from a new customer is 200 GPD, then 600 GPD of credits will be subtracted from the total available credits at all components downstream of where the new flow is introduced.

3.5.2 Additional Requirements

The following additional requirements must be met prior to capacity approval:

- Credits must be in place within the appropriate credit catchment prior to the time the proposed additional flow is introduced to the system.
- MSD has and will perform periodic reviews of estimated peak flow reductions or peak capacity additions and adjust current available credits and future credits achieved, as appropriate.

3.6 SPECIAL CONDITIONS

Several special conditions are included related to illicit connections and essential services.

3.6.1 Illicit Discharge Elimination

MSD may authorize a request for additional flow to the system, provided the additional flow eliminates illicit discharges of wastewater to the stormwater system, even if adequate capacity cannot be certified. However, a subtraction shall be made from the credit bank in an amount equal to the average projected flow from the correction of the illicit wastewater discharge.

3.6.2 Essential Facilities

MSD may authorize a request for additional flow to the system from essential service facilities, even if adequate capacity cannot be certified. Essential services are defined as critical or essential facilities such as, health care facilities, public safety facilities, public schools, other government facilities, or and in cases where a pollution or sanitary nuisance exists (as determined by the Louisville Metro Public Health and Wellness Department) in relation to on-site

septic systems. However, a subtraction shall be made from the credit bank in an amount equal to the average projected flow from these essential services.

3.6.3 Diversions of Existing Flow

MSD may authorize a request or internal capital project that diverts existing flow from one sewershed area to another if the environmental benefit of doing so is justified. This authorization may occur even if appropriate capacity cannot be certified.

SECTION 4 APPROVAL THROUGH CREDIT BANKING PROCEDURES

4.1 OVERVIEW OF CREDIT BANKING PROCEDURES

As discussed in Section 3, MSD may authorize additional wastewater flow to the system using a credit banking system. As MSD completes specific projects that increase capacity by reducing peak wet weather flows then MSD will bank flow credits. Credits can be used to offset proposed additional flows.

Figure 4.1 shows the approval through Credit Banking Procedures Step-by-Step diagram. The systematic approach in Figure 4.1 addresses new flows from development that have been approved according to Section 3, Figure 3.1.

4.1.1 Step-by Step Credits Banking Process

The description of the capacity process outlined below references the numbered steps in Figure 4-1. The numbered steps continue from Steps 1 – 10 in Section 3 (Figure 3.1).

STEP 11 - Confirm Capacity Certification Process Was Performed

The System Capacity Certification Process discussed in Section 3 must be completed prior to the Credit Banking Process. Two important pieces of information from the capacity certification process are required:

1. Location and estimated flows from the proposed development,

2. Documentation of reason for capacity request/certification denial (as outlined in figure 3.1).

If this information is not available, complete per system capacity certification procedures (Figure 3-1) before proceeding to **Step 12**.

STEP 12 – Do Available Conveyance System Credits Exceed New Flow within the Credits Catchment?

Determine if sufficient credits from system rehabilitation projects are available to offset the proposed new flow within the Credits Catchment where the new flow applies. If credits are

available, proceed to **Step 13**. If credits are not available, proceed to **Step 14**.

STEP 13 - Conditional Approval Pending Creation of Credits - Priority Waiting List – First In … First Out

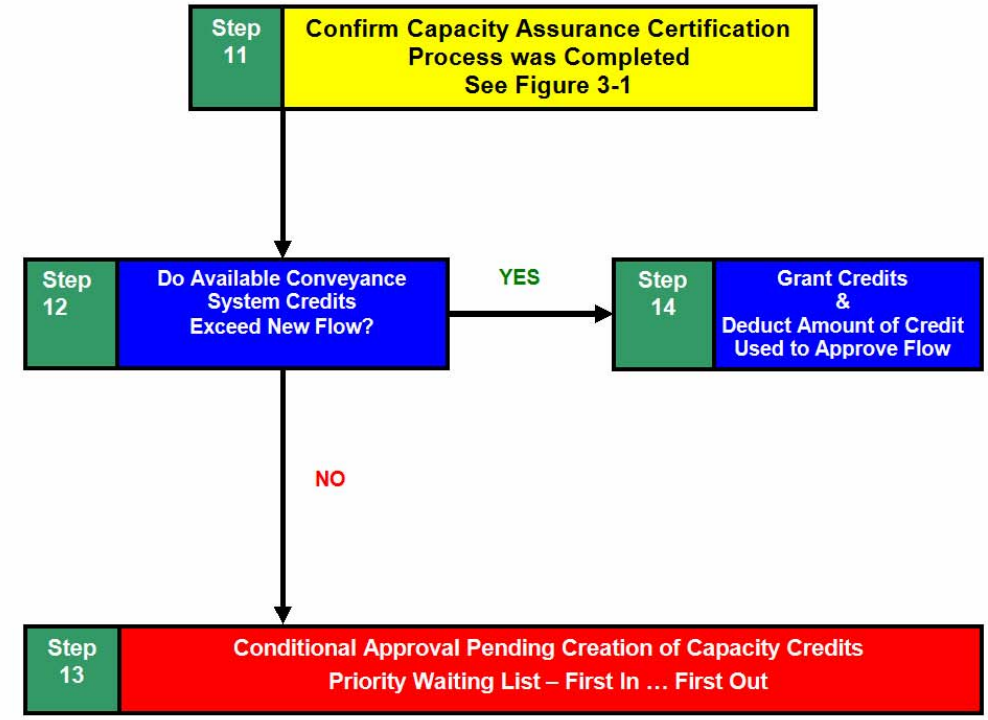
New flow requests will not be approved unless sufficient credits or capacities are available. The approval is conditional pending sewer rehabilitation credits becoming available. The new flow customer will be placed on a priority waiting list and will be approved when capacity or credits are available on a "first come first served" basis. Credits will be generated on a reasonable timetable.

STEP 14 – Grant Credits & Deduct Amount of Credit Used to Approve Flow

MSD approves the new flow request and then deducts the appropriate capacity credits from the Credits Bank.

Credits Banking Process

Figure 4.1



Credit Banking Process Definition:

The Credit Banking Process is an "In Lieu of Certification" process which provides MSD an opportunity to earn credits upon completion of specific projects that will add sewer capacity or reduce peak flows to areas of the system with capacity deficiencies.

CLEAN, GREEN, GROWING COMMUNITY

SECTION 5 – STANDARD PROCEDURES FOR CALCULATING AND TRACKING FLOW CREDITS

The SCAP requires a standard operating procedure to revise and implement processes to determine if capacity is available in the system. This section describes a standard process to document available capacity and create, calculate, track, and expend capacity credits.

Section 5.1 explains how MSD will accumulate capacity credits through I/I remediation projects, Section 5.2 explains how credits are calculated from I/I remediation, and Section 5.3 explains how credits are tracked and distributed to new flow requests within the IMS.

5.1 SEWER SYSTEM REHABILITATION AND I/I REMOVAL

All new flow requests where system capacity cannot be certified will be required to use capacity credits on a 3:1 ratio. The standard for 3:1 ratio is, for every one gallon of new flow, three gallons (3 capacity credits) must be removed within the system.

The SCAP goal is to ensure new flows do not exacerbate existing system deficiencies, therefore, the tracking of I/I removal is very important. This goal is achieved by requiring that in areas where system capacity cannot be certified, 3 gallons of I/I removal must occur before one gallon of new flow is added.

MSD continues to fund projects to remove I/I from the sanitary sewer system. Capacity restoration projects and capital projects completed to-date, include sewer line replacement, pump station upgrades, main line repairs, and the remediation of sewer lines, manholes, and service laterals. All of these repairs have increased peak wet weather capacity within the system by removing I/I. The intent of the SCAP is to begin tracking and taking credit for these flow reductions.

As MSD continues to repair, replace, and remediate the sewer system capacity, credits will be accrued on a one capacity credit per one gallon of I/I removal basis. The calculations for estimating gallons removed from different types of repairs and remediations are explained in the following section.

5.2 CALCULATING CREDITS

In order to accrue capacity credits for corrective actions, the estimated flow reduction or added capacity from corrective actions, must be calculated. The IMS will be used to track I/I removal or capacity restoration projects.

The following types of corrective actions are anticipated: rehabilitation of mainline sewers; manhole rehabilitation, downspout drain removals, foundation drain (sump pump) connection removals, area drain connection removals, and rehabilitation of sewer service laterals. The calculation of estimated flow reduction, or capacity increase, from each type of corrective action is discussed below.

5.2.1 Infrastructure Rehabilitation

Infrastructure or sewer rehabilitation includes several types of sewer system rehabilitation and removal of wet weather flows for which credits will be accumulated, including the following:

- Rehabilitation and/or modification of manholes;
- Disconnection of downspouts, foundation drains, sump pumps, etc.;
- Rehabilitation of deteriorated mainline sewers or private lateral corrections;

Manhole Rehabilitation

Primary repair mechanisms for manholes include chimney seals, full lining, and mechanical or chemical treatment. The estimated peak flow reduction is determined by severity and number of defects identified during inspection, as well as the location of the manhole and its susceptibility to inundation by rainwater during wet weather as defined below. The American Society of Civil Engineers, Manual of Practice No. 92 was used as the basis of classification.

Along a Stream - Manholes will be considered to be along a stream when they are located within 50-feet of a blue-line stream or within the floodway of a FEMA designated 1%-annual-chance (100-year) floodplain. If a 2-year floodplain boundary has been developed for a stream then manholes within the 2-year floodplain are also considered to be along a stream.

Non-Paved Areas - Manholes in non-paved areas that do not meet the along a stream definition.

Paved Areas - Manholes in paved areas that do not meet the along a stream definition.

Tables 5.1 through 5.3 provide the peak flow reduction given for paved areas, non-paved areas, and along a stream.

Table 5.1 – Peak Flow Reduction for Manholes in Paved Areas

Manhole Section	Reduction Values in Gallons Per Day (GPD)			
	Minor I/I	Moderate I/I	Heavy I/I	Severe I/I
Frame Seal	78	156	311	622
Chimney	78	156	311	622
Cone	78	156	311	622
Wall	39	78	156	311
Pipe Seal	39	78	156	311
Bench	39	78	156	311
Channel	39	78	156	311

Table 5.2 – Peak Flow Reduction for Manholes in Non-Paved Areas

Manhole Section	Reduction Values in Gallons Per Day (GPD)			
	Minor I/I	Moderate I/I	Heavy I/I	Severe I/I
Frame Seal	328	656	1,313	2,626
Chimney	328	656	1,313	2,626
Cone	328	656	1,313	2,626
Wall	164	328	656	1,313
Pipe Seal	164	328	656	1,313
Bench	164	328	656	1,313
Channel	164	328	656	1,313

Table 5.3 – Peak Flow Reduction for Manholes Along a Stream

Manhole Section	Reduction Values in Gallons Per Day (GPD)			
	Minor I/I	Moderate I/I	Heavy I/I	Severe I/I
Frame Seal	864	1,728	3,456	6,912
Chimney	864	1,728	3,456	6,912
Cone	864	1,728	3,456	6,912
Wall	432	864	1,728	3,456
Pipe Seal	432	864	1,728	3,456
Bench	432	864	1,728	3,456
Channel	432	864	1,728	3,456

Removal of Illicit Connections to the Sanitary Sewer System

Illicit connections to the sanitary sewer system are direct stormwater inflow sources. Disconnection of these sources can provide significant increases in capacity. The following are estimated peak flow reduction due to the removal of typical illicit connections.

Downspouts	4,000 GPD per downspout
Area Drains	6,000 GPD per area drain
Foundation Drains	4,000 GPD per foundation drain
Sump Pump	4,000 GPD per sump pump

Rehabilitation of Deteriorated Mainline Sewers and Sewer Service Lateral Corrections

The estimated peak flow reductions for mainline sewer rehabilitation or replacement (including service laterals) are as follows in GPD per inch diameter-mile (IDM) of pipe rehabilitated:

Stream Inundation / High Groundwater	34,000 GPD / IDM
Non- Inundation / Low Groundwater	60 GPD / IDM

5.3 CREDIT TRACKING

The amount of credit subtracted from the database to offset a proposed new flow addition will be determined based on the Credit Banking criteria discussed in Section 4 and above credit

amounts. Depending on the exact rehabilitation performed, the estimated peak flow reduction from each type of rehabilitation will be calculated as discussed above.

As the rehabilitation projects are completed, the associated credits will be made available for use in the Credit Banking process as discussed in Section 4. The IMS will track where each capacity credit is being used, and where the new flow request credits apply.

MSD has been performing rehabilitation and system improvements associated with the terms of the Consent Decree with KDOW and EPA. To capture the credits earned as a result of these improvements the effective retroactive date for credit claims is August 12, 2005.

SECTION 6 IMPLEMENTATION PLAN

MSD is currently changing its system capacity assurance procedures to coincide with the SCAP. This section lists the Major Implementation steps needed to fully implement and automate the components of the SCAP. These steps will be completed and in place by December 31, 2008 to coincide with the submittal of the Integrated Overflow Abatement Plan.

I. System Capacity Protocol

A. Implement WTP capacity protocol - *Completed*

B. Implement Pump Station Capacity Protocol
   i. Complete Testing
   ii. Develop capacity reports
   iii. Establish protocol for tracking LEs through pump stations

C. Implement Collection System Capacity Protocol
   i. Existing conditions model runs –. *Completed February 1, 2008*
   ii. 2-year 3-hour design storm model runs – *Completed April 1, 2008*
   iii. Establish protocol for tracking LEs through collection system
   iv. Implement collection system / modeling capacity protocol

D. Obtain operational input and deficiencies.

E. Capacity Assurance GIS Layers
   i. Documented SSOs - Existing
   ii. Sanitary Sewer Collection Lines - Existing
   iii. Pump Station and Force Mains - Existing
   iv. Wastewater Treatment Plants- Existing
   v. System Monitoring Locations- Completed December 2007
   vi. Sewershed Boundaries - Existing
   vii. Hydraulic Modeling Results
   viii. Credits Catchments – Completed April 2, 2008

F. Develop Capacity Assurance Databases within IMS.
   i. Designed, measured, and calculated capacities for sanitary sewer system assets
   ii. New Flow Database – *Completed*
      1. Pending Flow Requests,
      2. Committed/Approved Flow Requests
   iii. Pump Station Capacity Database –

1. Design capacities,
2. Drawdown information
3. Capacity with largest pump out of service,
4. Existing peak flow to pump stations,

iv. Certification and approval documentation
v. Sewer inspection and rehabilitation projects
vi. Capacity credits accounting and tracking system

II. Capacity Certification Determination Procedures

A. Incorporate new capacity process into the development review and approval of new LEs
   i. Develop Capacity Tracking Forms (or modify existing form)
B. Capacity Assurance Policy Definition for Development
   i. Definition of Timing before development can tie-in
   ii. Definition of maximum credits allowed or first come first serve
   iii. Capacity Assurance Fee timing and process
C. Establishing protocols for Red, Yellow, Green Zones for new connection consideration.

III. Approval through Credit Banking Procedures

A. Credit Banking System
   i. Incorporate Credits Banking Process into LE Review Process
   ii. Conditional approval pending credits creation protocol
   iii. Grant credits protocol and documentation
B. Capacity Assurance Fee:
   i. Revisions to rates, rentals, and charges.
   ii. Draft policy for fee collection
   iii. Enter into public comment
   iv. Present to MSD Board for review and approval
   v. Tracking of Rehab Dollars Protocol
   vi. Introduce policy to development community

IV. Standard Procedures for Creating and Tracking Flow Credits

A. Inspection and Rehab Prioritization and Implementation

i. Inspection & Rehab Prioritization – Capacity Requests & Potential Development Layer
ii. Inspection and Rehab Tracking
iii. Continuing Sanitary Sewer Assessment (CSSA) and Advanced Asset Management (AAM) Integration
iv. Annual contract setup for rehabilitation work covering inspection, construction

V. Organization / Administrative

A. Human Resources
    a. Identification of MSD personnel to coordinate rehabilitation to the areas of the approved capacity request and manage rehabilitation work and contracts
B. Personnel Needs Assessment
C. Staff Training for Full SCAP Implementation
    a. Train MSD Staff on Capacity Assurance Program
    b. LE Procedures Integration (GIS & Records, Development Team)
    c. PACP Code Implementation

        1. Training of MSD Staff – April 21, 2008
        2. MSD Staff Using Codes – June 1, 2008

D. Program and Tasks Ownership
E. Interdepartmental Communication Protocol

System Capacity Assurance Plan - Cedar Creek Credits Catchment

CHENOWETH HILLS

LAKE OF THE WOODS

CEDAR CREEK

FEGENBUSH LN

POPLAR LEVEL RD

FERN VALLEY RD

OUTER LOOP

BEULAH CHURCH RD

BARDSTOWN RD

I 265 SOUTH

I 265 NORTH

TAYLORSVILLE RD

PRESTON HWY

N

Not to Scale

- Haul Location

Documented Sanitary Sewer Overflow

- MSD Facility
- Service Connection

Sanitary Treatment Plant

- Regional WTP
- Small WTP
- Interceptor Sewer
- Force Main
- Sewer Collection System
- Sanitary Pump Station
- Streets
- Credits Catchment

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April 7, 2008

System Capacity Assurance Plan - Combined Sewer System

- Haul Location

Sanitary Treatment Plant
- Regional WTP
- Small WTP

Documented Sanitary Sewer Overflow
- MSD Facility
- Service Connection
- Interceptor Sewer
- Force Main
- Sewer Collection System
- Sanitary Pump Station
- Streets
- Combined Sewer System Area
- Credits Catchment

N

Not to Scale

OHIO RIVER
NORTHWESTERN PKY
SOUTHWESTERN PKY
N 22ND ST
W MAIN ST
W BROADWAY
S 22ND ST
ROY WILKINS AVE
E MAIN ST
I 71 NORTH
I 64 EAST
I 64 WEST
BROWNSBORO RD
FRANKFORT AVE
E BROADWAY
S PRESTON ST
S 3RD ST
S 2ND ST
U.S. HWY 60
BAXTER AVE
MORRIS FORMAN
ALGONQUIN PKY
S 7TH ST
DIXIE HWY
EASTERN PKY
NEWBURG RD
TREVILIAN WAY
I 264 WEST
TAYLORSVILLE RD
CANE RUN RD
I 264 EAST
BARDSTOWN RD
BEINHEIM-RUSH LN
POPLAR LEVEL RD
PRESTON HWY
I 65 NORTH
I 65 SOUTH
MANSLICK RD
TAYLOR BLVD
PALATKA RD

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System Capacity Assurance Plan - Floyds Fork Credits Catchment

N HURSTBOURNE PKY

S HURSTBOURNE PKY

BERRYTOWN WTP

STARVIEW

LAKE FOREST/BECKLEY WOODS

SHELBYVILLE RD

I 265 SOUTH

I 64 EAST

FLOYDS FORK

I 64 WEST

I 265 NORTH

EFFERSONTOWN

TAYLORSVILLE RD

Haul Location

Documented Sanitary Sewer Overflow

MSD Facility

Service Connection

Sanitary Treatment Plant

Regional WTP

Small WTP

Interceptor Sewer

Force Main

Sewer Collection System

Sanitary Pump Station

Streets

Credits Catchment

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Louisville/Jefferson County Information Consortium

April 8, 2008

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System Capacity Assurance Plan - Hite Creek Credits Catchment

HUNTING CREEK NORTH

HUNTING CREEK SOUTH

TIMBERLAKE

HITE CREEK

BROWNSBORO RD

BALLARDSVILLE RD

U S HIGHWAY 42

I 71 NORTH

I 71 SOUTH

NORTHBOURNE PKY

I 265 SOUTH

I 265 NORTH

BERRYTOWN WTP

N

Not to Scale

Haul Location

Documented Sanitary Sewer Overflow

MSD Facility

Service Connection

Sanitary Treatment Plant

Regional WTP

Small WTP

Interceptor Sewer

Force Main

Sewer Collection System

Sanitary Pump Station

Streets

Credits Catchment

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Louisville/Jefferson County Information Consortium

April 7, 2008

System Capacity Assurance Plan - Jeffersontown Credits Catchment

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Not to Scale

I 64 WEST

I 265 SOUTH

I 265 NORTH

S HURSTBOURNE PKY

TAYLORSVILLE RD

JEFFERSONTOWN

CHENOWETH HILLS

LAKE OF THE WOODS

- Haul Location

Documented Sanitary Sewer Overflow

- MSD Facility
- Service Connection

Sanitary Treatment Plant

- Regional WTP
- Small WTP
- Interceptor Sewer
- Force Main
- Sewer Collection System
- Sanitary Pump Station
- Streets
- Credits Catchment

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April 7, 2008

System Capacity Assurance Plan - Middle Fork Credits Catchment

- Haul Location
- **Documented Sanitary Sewer Overflow**
  - MSD Facility
  - Service Connection
- **Sanitary Treatment Plant**
  - Regional WTP
  - Small WTP
- Interceptor Sewer
- Force Main
- Sewer Collection System
- Sanitary Pump Station
- Streets
- Combined Sewer System Area
- Credits Catchment

OHIO R
RIVER RD
I 71 SOUTH
US HIGHWAY 42
I 265 SOUTH
I 265 NORTH
BANCROFT
I 264 WEST
N HURSTBOURNE PKY
BERRYTOWN WTP
FRANKFORT AVE
I 264 EAST
SHELBYVILLE RD
S HURSTBOURNE PKY
STARVIEW
I 64 EAST
I 64 WEST
TAYLORSVILLE RD
BARDSTOWN RD
N
Not to Scale

April 7, 2008

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System Capacity Assurance Plan - Mill Creek Credits Catchment

- Haul Location

Documented Sanitary Sewer Overflow

- MSD Facility
- Service Connection

Sanitary Treatment Plant

- Regional WTP
- Small WTP
- Interceptor Sewer
- Force Main
- Sewer Collection System
- Sanitary Pump Station
- Streets
- Combined Sewer System Area
- Credits Catchment

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April 7, 2008

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DIXIE HWY
S 3RD ST
EASTERN PKY
POPLAR LEVEL RD
S PRESTON ST
I 264 WEST
I 264 EAST
PRESTON HWY
I 65 NORTH
I 65 SOUTH
FERN VALLEY RD
TAYLOR BLVD
MANSLICK RD
PALATKA RD
NEW CUT RD
YORKTOWN
OUTER LOOP
I 265 SOUTH I 265 NORTH
GREENBELT HWY
WEST COUNTY
DANE RUN RD

System Capacity Assurance Plan - Northern Ditch Credits Catchment

Haul Location

Documented Sanitary Sewer Overflow

MSD Facility

Service Connection

Sanitary Treatment Plant

Regional WTP

Small WTP

Interceptor Sewer

Force Main

Sewer Collection System

Sanitary Pump Station

Streets

Combined Sewer System Area

Credits Catchment

S PRESTON ST

I 264 EAST

I 264 WEST

BARDSTOWN RD

FERNBUSH LN

TAYLOR BLVD

I 65 NORTH

POPLAR LEVEL RD

MAPLE LICK RD

NEW CUT RD

YORKTOWN

I 65 SOUTH

PRESTON HWY

OUTER LOOP

FERN VALLEY RD

N

Not to Scale

April 7, 2008

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System Capacity Assurance Plan - Ohio River Force Main Credits Catchment

- Haul Location

Documented Sanitary Sewer Overflow

- MSD Facility
- Service Connection

Sanitary Treatment Plant

- Regional WTP
- Small WTP
- Interceptor Sewer
- Force Main
- Sewer Collection System
- Sanitary Pump Station
- Streets
- Combined Sewer System Area
- Credits Catchment

N

Not to Scale

MSD

LOJIC

HUNTING CREEK NORTH
HUNTING CREEK SOUTH
KEN CARLA
TIMBERLAKE
SHADOW WOOD
GLENVIEW BLUFF
BANCROFT
HITE CREEK
BERRYTOWN WTP
U S HIGHWAY 42
I 71 SOUTH
I 71 NORTH
I 64 WEST
I 64 EAST
I 65 NORTH
I 264 EAST
I 264 WEST
I 265 NORTH
I 265 SOUTH
BROWNSBORO RD
BALLARDSVILLE RD
N HURSTBOURNE PKY
RIVER RD
E MAIN ST
FRANKFORT AVE

April 7, 2008

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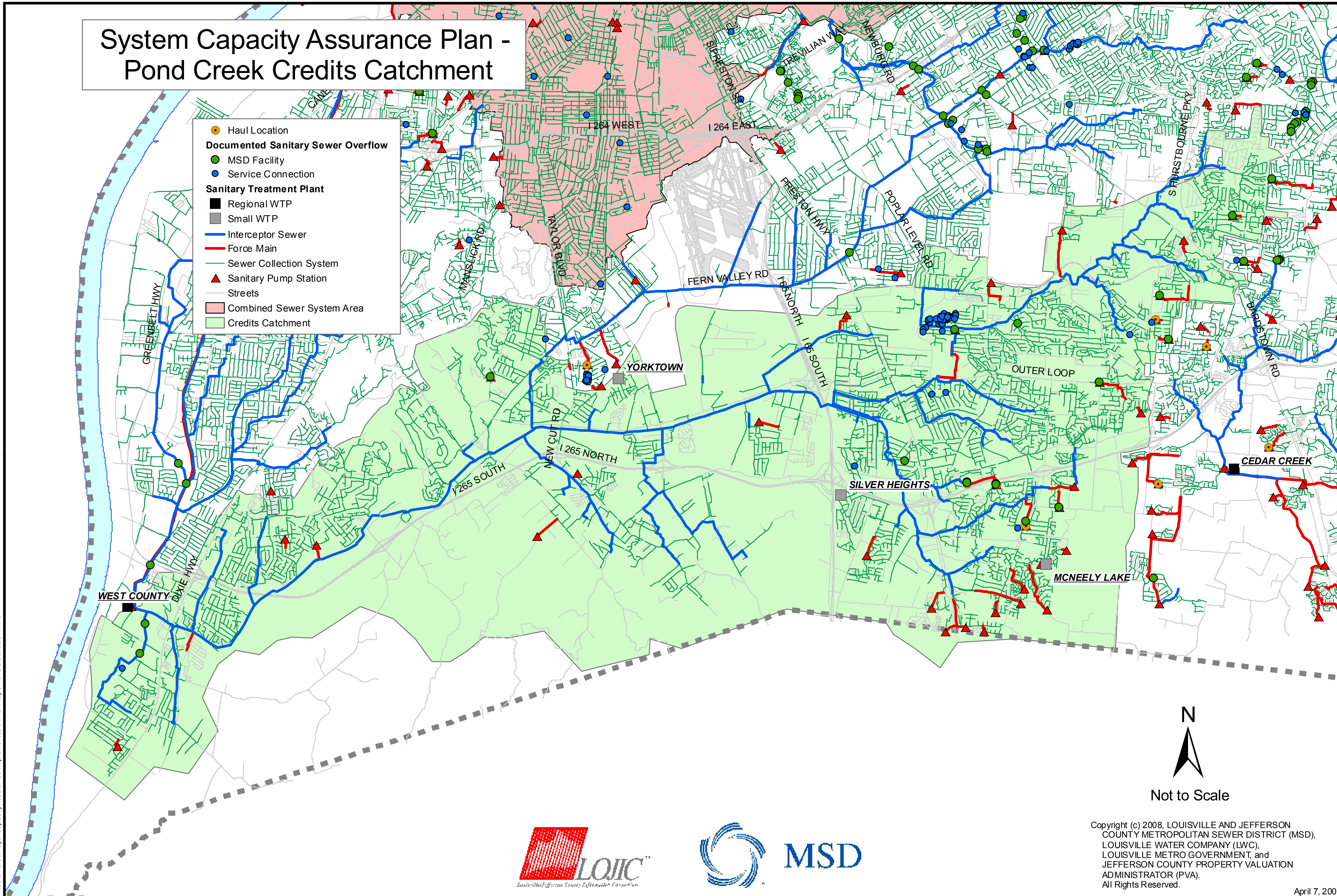
System Capacity Assurance Plan - Pond Creek Credits Catchment



April 7, 2008

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System Capacity Assurance Plan - Southeast Diversion Credits Catchment

- Haul Location

Sanitary Treatment Plant
- Regional WTP
- Small WTP

Documented Sanitary Sewer Overflow
- MSD Facility
- Service Connection
- Interceptor Sewer
- Force Main
- Sewer Collection System
- Sanitary Pump Station
- Streets
- Combined Sewer System Area
- Credits Catchment

I 64 EAST
I 64 WEST
I 264 WEST I 264 EAST
TAYLORSVILLE RD
NEWBURG RD
TREVILIAN WAY
S HURSTBOURNE PKWY
FEGENBUSH LN
PRESTON HWY
POPLAR LEVEL RD
FERN VALLEY RD
BARDSTOWN RD

N

Not to Scale

April 7, 2008

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Appendix B – Facility Capacity Reports

Current Regional WTP Capacities

WTP	Rated Capacity (MGD)	Peak Design (MGD)
Cedar Creek	7.5	26.0
Floyds Fork	3.25	10.4
Hite Creek	6	16.0
Jeffersontown	4	9.0
Morris Forman	120	350
West County	30	96

**Current as of 2/28/08*

Current Small WTP Capacities

WTP	Rated Capacity (GPD)	Peak Hour Capacity (GPD)
Bancroft	80,000	183,110
Berrytown	75,000	274,666
Chenoweth Hills	200,000	576,000
Glenview Acres	12,000	25,851
Glenview Bluff	10,000	25,851
Hunting Creek North	358,000	791,705
Hunting Creek South	251,000	630,115
Ken Carla	10,000	50,000
Lake Forest	470,000	1,034,035
Lake of the Woods	44,000	161,137
McNeely Lake	205,000	281,846
Shadow Wood	85,000	162,017
Silver Heights	500,000	888,624
Starview	100,000	288,000
Timberlake	200,000	646,272
Yorktown	150,000	432,000

**Current as of 2/28/08*

MSD

DOWNSTREAM FACILITIES CAPACITY REQUEST

Date:

Name of Development:

Address/Tax Block/Lot of Development:

☐ **Jefferson County** ☐ **Oldham County Sanitation District** ☐ **Other** _____

Owner/Developer:

Contact Name:

Company Name:

Address/City/State/Zip:

Tel. No.: **FAX No.** **E-Mail:**

Design Firm/Contact:

Contact Name:

Company Name:

Address/City/State/Zip:

Tel. No.: **FAX No.** **E-Mail:**

Closest Sewer Connection:

Record Number: **Manhole Number:**

Attach Map with Site Labels & Manhole (SUBMITTALS WITHOUT A MAP WILL BE REJECTED)

Wastewater Treatment Plant Service Area:

Amount of Flow (Based on MSD Standards): _____ GPD

Show Calculation:

Number of: Homes: _____
Apts.: One BDR: _____ Two BDR: _____ Three BDR: _____
Condos: One BDR: _____ Two BDR: _____ Three BDR: _____

Commercial (Describe):

Industrial (Describe):

Pump Station Needed: Yes ☐ No ☐ Recapture Area: Yes ☐ No ☐

ADDITIONAL COMMENTS: _____

FOR MSD USE ONLY

LE/Application #: _____

Capacity Determination:

Approved ☐ Not Approved ☐ Flow_____Until _____
(If you wish to reserve capacity beyond the 90 reservation period, please call Development Team Manager)

MSD _____Date _____

Please retain this form to submit with Application for Approval of Sanitary Sewer Projects

Downstream Facilities Capacity Request
Submittal Assistance Document

The Downstream Facilities Capacity Request (DFCR) is submitted for the purpose of determining if capacity exists for your Lateral Extension Project. Included with the submittal of the DFCR must be a Site Location Map with the parcel(s) to be served noted.

MSD seeks to provide a prompt definitive determination of capacity on your project. Diligent submittal of information on the DFCR and Site Location Map documents is essential. Submittals that include omissions and/or erroneous information can lead to delayed determination of capacity on your project. Anywhere there is information requested on the DFCR form, and that information does not apply to your project, at a minimum insert "NA". A short explanation of why information is not included on the DFCR maybe helpful in making a prompt capacity determination on your project.

Below is information that will help you provide the essential information needed to determine capacity for your project.

1. **Date** - is the date that the form is completed for submittal to MSD. (MSD will stamp the document with the received date upon reception of the submittal at MSD).

2. **Name of Development** - if the development does not currently have a name, or will not be named, reference the development by street name accompanied with the word which best describes the development type. For instance, East Broadway Commercial Development, Grandview Apartments, Bardstown Road Condos, etc.

3. **Address/Tax Block/ Lot of Development** – please provide both the property address, and Tax Block / Lot number. If a valid address does not exist, tax block and lot will suffice. If the project will exist on more than one address, please provide those addresses also.

4. **Owner/Developer's Name** –include an owner or developer contact name. Inclusion of the Owner/Developer name will assist MSD in communications that may eliminate delays.

5. **Owner/Developer's Address** – address where Owner/Developer contact name will receive mail.

6. **Owner/Developer's Tel. No**. – include the telephone number that will most likely lead to immediate contact of Owner/Developer Contact Name. Inclusion of more than one telephone number is welcomed.

7. **Closest Sewer Connection**:
   - Record Number
   - Manhole Number
   - MSD Atlas Page
   - Wastewater Treatment Plant Service Area

   This information is readily attainable in the MSD Sewer Atlas. For information on how to attain a MSD Sewer Atlas, call MSD Customer Relations at 587-0603. The Closest Sewer Connection information is also attainable by calling MSD Customer Relations at 587-0603 and speaking to a Customer Relations agent.

8. **Amount of Flow** – the MSD Design Manual, pages 8-18 through 8-20, include the information needed to calculate the amount of flow from the development to the MSD system. The Design Manual Information can be retrieved from MSD's website at http://www.msdlouky.org/insidemsd/pdfs/designmanual02/Chapt08-2000.pdf.

9. **Pump Station needed –** the designation of whether a pump station is needed is required to assess if your project can be developed.

10. **Recapture Area –** if you do not know whether your project resides in a recapture area**,** you may call MSD Customer Relations at 587-0603 to get the answer.

Downstream Facilities Capacity Request
Site Location Map

The Site Location Map (SLM) is used to determine the general location of the project for which sanitary sewer capacity is sought. The SLM maybe a copy of a USGS map, Sewer Atlas map, Topographical map, MapsCo map, or any similar map which can easily depict the location of your project in MSD's service area.

The SLM must include a North arrow designation and drawn boundaries of the development site.

LATERAL EXTENSION JUST IN TIME SUBMITTALS

Tuesday, October 09, 2007

CUSTOMER

SUBMITTAL 1 CAPACITY

REQUEST FOR SANITARY SEWER CAPACITY FORM

SITE LOCATION MAP

SUBMITTAL 2 DESIGN

APPROVED REQUEST FOR SANITARY SEWER CAPACITY FORM

APPLICATION FOR APPROVAL OF CONSTRUCTION DOCUMENTS PLANS

DIV OF WATER SEWERAGE APPLICATION WITH:
APPLICATION FEE
USGS QUAD MAP
SERVICE AREA MAP

DESIGN PLANS

SUMMARY OF PROPERTY TYPE AND UNITS TO BE SERVED

COMPUTATION SHEET FOR SANITARY SEWER DESIGN

PROPOSED PROJECT PLAN

SPECIAL PROVISIONS

ROADWAY PLANS (if needed)

COPIES OF LETTERS TRANSMITTING PLANS TO VARIOUS UTILITIES (if needed)

PUMP STATION SERVICE
- AREA MAP WITH FLOWS
- CALCULATIONS
- SPECIFICATIONS

(if needed)

RESERVATION OF CAPACITY (if needed)

SUBMITTAL 3 MYLARS

MYLARS

PERMITS, CONTRACTS & PAYMENTS

SUBMITTAL 4

LETTER OF APPROVAL FROM METRO HEALTH

LETTER OF APPROVAL FROM THE DOW

SITE DISTURBANCE FORM

RAILROAD CROSSING PERMIT APPLICATION (if needed)

KTC ENCROACHMENT PERMIT APPLICATION (if needed)

LATERAL EXTENSION OF BOUNDARIES AGREEMENT WITH:
- PROPERTY DEED
- PERFORMANCE BOND WITH POWER OF ATTORNEY
- MAINTENANCE BOND WITH POWER OF ATTORNEY
- CERTIFICATE OF LIABILITY INSURANCE
- ACCEPTED BID PROPOSAL SIGNED WITH ENCROACH-MENT DATA
- EASEMENT PLATS

OR

EXTENSION OF BOUNDARIES AGREEMENT WITH:
- PROPERTY DEED

SUBMITTAL 5

CAPACITY CHARGE PAYMENT (or LETTER OF CREDIT)

LETTER OF APPROVAL FROM FIRST CLASS CITY (if needed)

DOW STREAM CROSSING PERMIT (if needed)

CORPS OF ENGINEERS STREAM CROSSING PERMIT (if needed)

RECAPTURE CHARGE (if needed)

TELEMETRY PAYMENT (if needed)

METRO ENCROACH-MENT PERMIT (if needed)

SUBMITTAL 6 CONSTRUCTION

SWORN STATEMENT OF FINAL PAYMENT – CONTRACTOR

SWORN STATEMENT OF FINAL PAYMENT – DEVELOPER

AS BUILT CERTIFICATION LETTER TO DOW

AS BUILT DRAWINGS

MSD

CAPACITY APPROVAL

DESIGN APPROVAL

MYLARS APPROVAL

NOTICE TO PROCEED

SEWER RELEASE

LATERAL EXTENSION PROCEDURES

The construction of new sanitary facilities requires the approval of the following public agencies:

A. Jefferson County
   1. Louisville & Jefferson County Metropolitan Sewer District (MSD)
   2. Louisville Metro Health Department (HD)
   3. Kentucky Division of Water (DOW)
   4. Metropolitan Louisville
   5. Fourth Class Cities

B. Oldham County
   1. Louisville & Jefferson County Metropolitan Sewer District (MSD)
   2. Kentucky Division of Water (DOW)
   3. City of Crestwood or Oldham County Sanitation District depending on location

The purpose of this document is to provide developers, engineers, and others with a concise listing of the items required by MSD in order to approve plans and special provisions for a Lateral Extension (LE) or a Private Sewer – MSD System or a Non-MSD System project for construction of sanitary sewers and pumping stations. All sanitary projects which will become a part of MSD's system require the execution of a Wastewater Facilities Lateral Extension Contract or approval from MSD for the proposed project.

Sanitary projects which connect to systems which are not owned by MSD and will not be in an Easement or public Right of Way are subject to the same review and approval procedures, but do not require the execution of a contract with MSD. Unless otherwise noted, it should be assumed that all items in this document will be necessary for sanitary projects associated with non-MSD owned systems.

MSD has prepared a number of documents which are available to the engineer for wastewater projects. These items can be used as guides in order to facilitate the projects. A Design Manual, Standard Drawings, Standard Specifications, Special Provisions, a Pre-Approved Products List and a Design Manual are all available for these purposes.

The process begins with submittal of a capacity Worksheet to determine if the sewer system has capacity. Next a design approval must be obtained from MSD before the HD and DOW will review the set of plans for the project. This will reduce the overall time frame to start construction because MSD usually performs a much more detailed review than the other two agencies.

PLANNING PHASE

Any proposed project which will connect to an MSD system should begin with a written request for service (Request for Sanitary Sewer Capacity Form and Location Map). This is a required step to prevent having the Developers run the risk of having plans prepared only to find that capacity for their project is not available or some other issue comes up that delays their project. The written request should include a location map.

Capacity Charges. All new developments which connect to MSD's system must pay capacity charges unless exempted from the charges. A capacity charge worksheet will be prepared to detail the capacity charge due for the development. Capacity Charges must be paid prior to MSD issuing a Notice-To-Proceed for construction. The specific language detailing whether or not a piece of property can be exempted is contained in MSD's Wastewater Service Charges, but generally, exemptions are allowed for properties which meet any of the following criteria:

1. Development previously served by a non-MSD system or by an on-site disposal system.

2. Property does not require a connection or an extension of the MSD's sewer system

3. Property within an Enterprise Zone.

4. Property owned by the City of Louisville, Jefferson County, or joint agencies of the City of Louisville and Jefferson County.

5. Property within the City of Louisville.

6. Properties to be served by a new treatment plant to be owned by MSD, but constructed and financed jointly by agreement between MSD and one or more developers, provided that the plant is constructed as a permanent, long-term facility.

7. Properties that are exempted because of previous agreements. These will usually be covered by treatment plant takeovers whereby the previous owner has identified specific properties.

Capacity charges are calculated either by the number of lots in a subdivision, the estimated gallons per day flow from the proposed structure, the estimated flow based on the number of employees, the flow based on actual water records of a similar type of facility. The minimum charge is based on a single family home of 370 gallons per day. For design flows and estimated flows from a variety of different types of facilities, see Chapter 8 of the Design Manual.

Reservation of Capacity Agreements. The developer may choose the option of executing a separate reservation of capacity agreement rather than paying capacity charges in the early stages of a development to assure capacity in the system will remain while going through decision making process of determining whether to proceed with the project. Capacity charges will still be due, but they may be deferred until the LE Contract is executed. By reserving capacity for one developer, MSD may have to turn down other requests and could lose the revenue from those potential customers. Therefore the agreement will specify that a monthly fee must be paid to MSD which is equal to the average wastewater service charge from the development. The agreement will be limited to two years. In order to process the agreement, the developer must provide the tax block and lot number for the property, along with the deed book and page number, the amount of flow to be reserved, and a project map showing the proposed development. The reservation of capacity must remain with the property and cannot be transferred to another parcel.

New or Expanded Wastewater Treatment Plants. If a new development will require modifications to an existing treatment plant, or construction of a new plant, MSD has established guidelines for processing the design and approval of such facilities. The guidelines generally apply to wastewater treatment plants with a design capacity of 500,000 gallons per day, or less, and are available upon request.

DESIGN PHASE

Specific items which must be submitted to MSD as part of the design review submittal process are identified below:

1. **Application For Approval Of Contract Documents for Sanitary Sewer Projects**. This provides basic information about the project, along with the terms and conditions of the approval. It should be noted that MSD's approval is only valid for a period of one year.

2. **Minimum Requirements Checklist for Sanitary Sewer Construction Plans**. This form must be included with the original application. It provides the Applicant with a listing of items normally required for MSD to complete its review of the material.

3. **Construction Plans**. Plan drafting standards and design criteria are covered in MSD's Design Manual. Generally, final plans must be submitted on double-matte, 24" x 36" sheet mylar, with a minimum thickness of 3 mils. Review transmittal copies may be standard blue-line or black-line prints. Two (2) copies are required for each submission. The title sheet should include a location map, a sheet index, the name, address and telephone number of the engineer who prepared the plans, the name, address and telephone number of the developer, the name, address and telephone number of the owner, the surveyor's certification block with a Professional Surveyor's seal, signature and date, a legend, standard and special notes, the Professional Engineer's seal, signature and date, and an approval block for MSD. All sheets must include the project name, the developer's information, the owner's information, the engineer's information, sheet title, submittal date, Professional Engineer seal/signature/date, and Professional Land Surveyor seal/signature/date. The seals and signatures of the engineer and the surveyor (both of whom must be currently licensed in the Commonwealth of Kentucky) must be originals. The Professional Engineer's seal/signature/date is required on all sheets and the Professional Land Surveyor's seal/signature/date is required on all sheets with boundaries shown.

4. **Special Provisions.** Special provisions shall be submitted project and shall be adjusted to address the specifics of the project.

5. **Design Calculations.** The proposed development, along with all upstream or tributary areas must be shown on a topographic map at an appropriate scale. The expected saturation population, based on current zoning, should be used to size the proposed sewers. Population based on zoning can be found in Chapter 8 of MSD's Design Manual. It should be noted that MSD may require improvements to downstream facilities in order to accommodate the flow from proposed developments. This will be determined on a case-by-case basis. Reference should be made to Chapter 8 of the Design Manual for the required "Computations For Sanitary Sewer Design" format and instructions.

6. **Extension of Boundaries.** This item is required to be submitted if the project is outside the City of Louisville Boundaries of 1947 and will be an extension of MSD's system.

7. **Easement Plats (if required).** Plats must meet minimum standards for land surveying in Kentucky. They must be certified and sealed by a Professional Land Surveyor currently licensed in the Commonwealth of Kentucky. Two (2) copies are required for each submission, and the original plats must be included with the final submission of documents. MSD will be responsible for recording all easements for public sewers in Jefferson County. In Oldham County, MSD must be provided a copy of the recorded easement. See Chapter 7 of MSD's Design Manual for guidelines.

8. **Record Plat.** A copy of the record plat (recorded or unrecorded) is acceptable. This must be submitted in order for MSD to determine whether or not additional sewer and drainage easements will be required. Before MSD will allow sanitary sewers to be accepted and put into service, all public sewers must be in public rights of way or in a public easement.

9. **Preliminary Subdivision Plans.** A copy of the approved preliminary subdivision plans should be submitted with the original submission.

10. **Roadway Plans (if applicable).** A copy of the roadway plans should be submitted in order for MSD to determine if sufficient cover will be available and to ensure that there are no conflicts with any other proposed facilities.

11. **Contacting Other Utilities.** Documentation must be provided showing that potential conflicts with existing utilities have been addressed to the satisfaction of the utility company. MSD must be copied on all letters and transmittals to and from the various utility companies.

12. **City/County/State Permits.** If proposed sewers will be located within, or crossing, the right of way of existing roads, or if proposed sewers will be located outside of the pavement of proposed roads, but still within the right of way, an encroachment permit is needed from the appropriate agency. MSD will apply for the encroachment permit, with the exception of Non-MSD Systems, from the governing agency prior to the start of construction. The Design Drawings and Special Provisions provided by the Design Engineer must include the requirements of the governing agency. It is assumed that the Design Engineer has been in contact with the Regulating Agency prior to submittal of the Encroachment Permit. Two (2)

sets of plans need to be submitted to MSD after the project has received the Design Approval. These sets of plans will then be sent to the governing agency for their review and issuance of the encroachment permit. Seven (7) sets of plans are needed for submittal to the State. The encroachment permit or permits will be included with the package issued with the Notice-Of-Proceed for construction by MSD.

13. **Small City Permits.** If the proposed facilities will be located within the corporate limits of any third or fourth class cities, completed permits showing MSD as the Applicant must be included. The developer/engineer is also responsible for complying with any additional ordinances (e.g. tree cutting) which may be required by third or fourth class cities. Approved permits must be included with the final submittal of plans to MSD. Fifth and sixth class cities will be notified of the proposed project by MSD. Any other requirements by the 5th and 6th class cities shall be handled on a case-by-case basis. MSD must be copied on all correspondence to and from the small city.

14. **Railroad Crossings.** If proposed sewers will be located within, or crossing, the right of way of existing railroads, executed easement plats must be included for each occurrence. Permits will not be acceptable. MSD must be copied on all correspondence to and from the governing railroad. Applicant is responsible for payment of all fees.

15. **Miscellaneous Permits.** If proposed sewers will be located within, or crossing, the right of way of any other existing facilities (e.g. Texas Gas), completed permits showing MSD as the Applicant must be included in the final submittal of plans to MSD. MSD must be copied on all correspondence to and from the agency.

16. **Proposed Project Plan.** An 8 1/2" x 11" drawing showing the proposed project must be submitted to MSD. In order to provide consistency in the appearance of project plans, please use the template provided. Hand lettering is not allowed. The Proposed Project Plan should be submitted with the original submission.

17. **Erosion/Sediment Control Plan.** The Engineer must submit a plan for erosion and sediment control. It must specify the construction sequence, the individual responsible for maintenance, and the removal of all temporary devices when they are no longer necessary. The erosion and sediment control plan must include the actual depths and locations of all control measures, including any additional items as required by the Louisville and Jefferson County Planning Commission. The plan must be stamped and sealed by a Kentucky licensed

engineer. A Notice of Intent permit should be submitted to DOW 72 hours before construction starts.

18. **Wastewater Facilities Lateral Extension Contract.** This document is the legal agreement between the developer and MSD regarding the construction of sanitary sewerage facilities. It conveys the sewerage facilities to MSD, upon completion and acceptance by MSD. The developer agrees to construct the project according to the plans, special provisions and specifications, to employ an engineer to be available during construction, to review shop drawing submittals and other services as the developer's representative, to commence the project within one year, and to furnish record information once the job is finished. MSD agrees to inspect the work, and to accept ownership of the facilities, along with operation and maintenance responsibilities, once they are completed.

19. **Accepted Bid Proposal.** MSD requires that the lump sum cost for the construction of the sanitary sewers be submitted. The lump sum amount shown on the form shall be the same as the amount shown on the Performance Bond.

20. **Bonds.** MSD requires that a Performance Bond be posted covering the cost of sewer facilities construction during construction.

    If the proposed sanitary facilities will be located under any pavement (roads, streets, parking lots, driveways of any material besides earth), MSD will also require that a Maintenance Bond be posted in the amount calculated by the engineer in accordance with the guidelines specified in the "Instructions For Special Provisions" and indicated in the Special Provisions ($5,000.00 minimum, $4 per LF under Pavement county Road, $50 per LF under State Maintained Road).

    After the project has been accepted by MSD, a one-year warranty period begins. If there are no problems with the facilities after one year, MSD will release the bonds.

21. **Pump Stations –** All four (4) of the following items must be submitted, for either a public or private pump station, before the review will take place.

    Service Area Map **–** A topographic map showing the proposed development, along with all upstream or tributary areas shown. The expected saturation population, based on current zoning, should be shown in each area of the map**.**

Calculations – The calculations should be for both the initial and the ultimate conditions. All calculations shall be presented in a neat an orderly manner.

Specifications – MSD's standard specifications for both the grinder and the solid-passing pumps shall be used. The appropriate modifications and spaces need to be filled-in before submitting for review.

Design Drawings

22. **Plan Review and Approval.** MSD will review the information submitted, assign an LE and/or Record number and Manhole numbers to the project, and usually return comments to the contact person as specified on the "Application for Approval of Contract Documents For Sanitary Sewer Projects," within ten (10) working days. If a meeting is in order, MSD and the project engineer will discuss the project in detail. After revisions have been made and returned along with all MSD "mark-ups", MSD will review the submittal and if everything is in order, issue a Design Approval letter. When MSD receives written approval from other governing agencies, the engineer submits the original mylars to MSD along with any corrected copies of all items, including the completed developer signed LE Contract, the appropriate bonds, and all other required documents. Note: If there are any revisions to the plans, prior to construction, new mylars must be submitted before the project will be released for construction.

CONSTRUCTION PHASE

After receiving the completed design documents, all required permits and easements, performance and maintenance bonds, drawings on mylar, special provisions, other agency approvals and capacity charges payments, MSD will issue a Notice-To-Proceed letter for construction and assign an inspector to the job (if applicable). This process will normally take five (5) working days. Construction must commence within one year of the Notice-To-Proceed date. After completion of the sewer installation, the Contractor in accordance with the plans, special provisions and specifications and MSD's inspection, will conduct an initial air and deflection test of all of the lines. After all other utilities have been installed, a second air test will be performed by the Contractor and the lines will be teleinspected. Once pavement is installed, the chimney shall be sealed and the manhole vacuum tested. Assuming all tests are passed, the teleinspection does not reveal any problems, and appropriate restoration of the

disturbed area has been completed in accordance with the Erosion and Sediment Control Plan and all other close out criteria are met, MSD will accept the sewers and release the lines for connections, by notifying the appropriate agencies, (HD, OCSD or City of Crestwood) in writing. In order to connect any buildings to the sewers, the developer must obtain permission from the HD.

Revisions During Construction. If minor changes to the project are necessary during construction, the developer's engineer should try to resolve the matter by discussing it with MSD's inspector. MSD's inspector will determine whether or not additional review is required. If additional review is required, the developer's engineer must submit a "red-line" drawing of the proposed changes to MSD, who will make a decision on the matter as soon as possible and will notify the developer's engineer of the changes approval. The developer's engineer will then submit four (4) copies of the "red-line" drawings to MSD for distributing them to the field. "Significant" changes may require HD and DOW approval.

Property Service Connections. Each separate piece of property must have a property service connection (PSC) from the public sewer. The size of PSC's for single family residential properties is 4-inches. PSC's for other properties must be sized in accordance with KY Plumbing Codes with the a minimum being 6-inches. The PSC must be installed with green metallic "locator" tape labeled "SEWER" above the PSC and at a depth of not more than 30". The depth of each PSC at the property line (or the edge of the easement) must be shown on the plans. If basement facilities are to be served, the minimum elevation of the lowest facility must be at least six inches higher than the rim elevation of the nearest manhole on the line to which the property will be connected. For additional information, see Chapter 8 of MSD's Design Manual.

Record Drawings. Once construction is completed, the developer's engineer/surveyor must revise the original mylars to accurately reflect the size, location, depth, etc. of the facilities, the location of property service connections and easement data. PSC information which must be shown on the drawings includes the location of the PSC in relation to the sewer along with the length and size of the PSC and any other information referenced in the special provisions under the "Stakes and Final Record Drawing" section. This information should also be shown on the "Property Service Connections Inlet Sheet". The revisions must be made in MSD's Main Office. Original mylars may not be taken out of the building. MSD will provide drafting space for the developer's representative to make the necessary changes. When completed, the drawings must be signed and sealed by a Land Surveyor who is licensed in the State of Kentucky. The sewers will not be made available until all of this information is completed.

The Following notes shall be added to the mylar:

MSD does not warrant the design or computations contained in this plan. The correctness or accuracy of all engineering computations remain the sole responsibility of applicant's design professional. MSD's approval to proceed with construction is based solely on that professional's seal and signature.

UTILITY NOTE

All utilities shown on these plans are approximate. Individual service lines are not shown. The Contractor or Subcontractor shall Notify the Utility Protection Center "B.U.D." (Toll Free Phone No. 1-800-752-6007) forty-eight (48) hours in advance of any construction on this project. This number was established to provide accurate locations of existing below ground utilities (i.e. cables, electric wires, gas, and water lines). The Contractor shall be responsible for becoming familiar with all utility requirements set forth on the Plans in the Technical Specifications and Special Provisions.

EROSION PREVENTION AND SEDIMENT CONTROL NOTE:

The approved erosion prevention and sediment control (EPSC) plan shall be implemented prior to any land-disturbing activity on the construction site. Any modifications to the approved EPSC plan must be reviewed and approved prior to implementation by MSD's Development Area Team. EPSC BMP's (Best Management Practices) shall be installed per the plan and MSD standards.

Where construction or land disturbance activity will or has temporarily ceased on any portion of a site, Temporary site stabilization measures shall be required as soon as practicable, but no later than 14 days after the activity has ceased.

Sediment laden water encountered during trenching, boring, or other activities shall be pumped into a sediment trapping device prior to being discharged.

GENERAL NOTES:

1. **The Louisville and Jefferson County Metropolitan Sewer Districts Standard Specifications shall apply.**

2. **Construct Property Service Connections to edge of Easement or Edge of Right of way.**

3. **Property Service Connections shall be at a 2.0% slope or greater.**

4. **Rock shall be shattered to 6 feet beyond end of Property Service Connection.**

5. **Vertical Datum is referenced to _____ National Geodetic Vertical Datum.**

6. **Sewage from this development will be treated at the _____ Sewage Treatment Plant.**

7. **MSD will inspect all sewer construction.**

8. **All sewers will receive a first and second air test, deflection test, have chimney seals installed and manholes vacuum tested in accordance with MSD's Standard Specifications.**

If the Engineer of Record wishes to make revisions electronically, the revised item shall be lined through and the new information added so it becomes clear what items were revised. **The following note shall be added to the mylar:**

For the purpose of supplying record drawing information, sheets_____ of the original drawings replaces the approved

sheets _____ of construction drawings. Drawings had been design approved by _____ on_____ and approved for construction by _____ on _____. The original Drawings have been Archived.

Connection Availability. After construction is completed, the applicant (or the applicant's representative) must complete an Available for Connections form which indicates that lines have been installed, have been tested, and meet MSD's requirements. MSD will then forward the form to the appropriate agencies. **The following note shall be added to the mylar:**

The Final Record Information in this drawing was provided by the Professional Land Surveyor _____ on _____. The Property Service Connection information was collected by the General Contractor _____ with no field verification by the Professional Land Surveyor. The Final Record Data and Property Service Connection information has been accepted by MSD Inspector_____ on _____.

Warranty Period. After construction is complete, the record drawings have been corrected to show "As Builts", MSD has received the "Contractor's Sworn Statement of Final Payment and the "Applicant's Sworn Statement of Final Payment", the Engineer of Record has sent a letter to the Kentucky Division of Water informing them that the sewer construction is complete or noting the differences that took place during construction and all outstanding complaints have been resolved, MSD will begin the formal one year warranty period, by issuing a "Letter of Acceptance" to that effect. Assuming there are no defects with the facilities, the bonds for the sewers will be released at the end of one year. Roadway and pavement warranties must be in effect for one year.