

Vision for MSD's Integrated Overflow Abatement Plan December 10, 2008

This document summarizes the vision for MSD's Integrated Overflow Abatement Plan (IOAP), as understood and endorsed by the Wet Weather Team (WWT).

Scope of the Integrated Overflow Abatement Plan and Expected Water Quality Benefits

The Louisville and Jefferson County Metropolitan Sewer District's Integrated Overflow Abatement Plan is a long-term plan to control combined sewer overflows (CSOs) and sanitary sewer overflows (SSOs) in the community. The IOAP is expected to improve water quality in both Jefferson County streams and the Ohio River. The expected water quality benefits of the IOAP include: (a) reductions in the peak levels of bacteria in Beargrass Creek and other Jefferson County waterways; and (b) a reduction in the duration of wet weather impairment of local waterways (i.e., the number of days that bacteria levels exceed water quality standards during periods of wet weather). The IOAP—in coordination with other community water quality initiatives (further described below)—will also improve water quality under ambient conditions.

The specific benefits anticipated from the IOAP include the following:

- The suite of projects selected for the Long Term Control Plan (LTCP) for CSOs will result in approximately 95 percent capture and treatment of wet weather combined sewage during an average year. (As a point of reference, the “presumptive approach” in EPA’s CSO Control Policy is based on a minimum of 85 percent wet weather capture.)
- Remaining CSO loads (after removing background) will no longer “cause or contribute” (as defined in EPA’s CSO Control Policy) to water quality standard violations in the Ohio River. Peak fecal coliform counts are modeled to be reduced by 54 percent, from 100,000 colony forming units per 100 milliliter (cfu/100mL) to 46,000 cfu/100 mL (downstream from Morris Forman Wastewater Treatment Plant).
- In Beargrass Creek peak fecal coliform counts are modeled to be reduced by 18 percent, from 44,300 cfu/100mL to 37,400 cfu/100 mL (at the mouth of Beargrass Creek). The control level associated with these reductions exceeds the EPA CSO Control Policy “presumptive approach,” 85 percent wet weather capture threshold and reflects a point of significantly diminishing returns under the “knee of the curve” benefit-cost analysis.
- The suite of projects selected for the Sanitary Sewer Discharge Plan (SSDP) for SSOs will result in the elimination of capacity-related SSOs up to the site-specific level of protection (described below).
- The SSO projects are anticipated to eliminate an average of 145 SSO events per year, based on 2005–2007 data.
- In terms of water quality, SSO projects will eliminate an average of 290 million gallons of overflow volume per year (average of 2005–2007 normalized for rainfall), eliminating 100 tons of 5-day biochemical oxygen demand (BOD5) and almost 200 tons of solids annually.

Along with delivering water quality improvements from sewer overflow control, MSD participates in other community water quality improvement efforts. Sewer overflow control is essential to improving water quality, but overflow control alone is not enough to meet water quality standards. In light of this challenge, MSD will continue to leverage its role in supporting broader water quality improvement efforts in the community. The IOAP will be one of the key elements of MSD’s participation in those water quality improvement efforts. In particular, the IOAP will be complementary to other wet weather and water quality programs managed by MSD and/or by other community partners. These complementary

efforts include, but are not limited to, the Mayor’s “Go Green Louisville” Initiative, the Partnership for a Green City, Metro Louisville’s Municipal Separate Storm Sewer System (MS4) discharge permit, and initiatives of Jefferson County Public Schools (JCPS), private developers, and other entities.¹

The specific ways in which MSD is collaborating with other entities on community water quality improvement initiatives include the following:

- **Partnership for a Green City:** MSD is actively working with Louisville Metro Government, JCPS, and the University of Louisville to improve water quality through the Partnership for a Green City. The Partnership has established a Stormwater Committee that will be identifying opportunities to improve water quality associated with planned capital projects.
- **Metro Government:** MSD is an active participant in the Mayor’s Go Green Louisville Initiative, which includes in its vision a commitment to focus on financially sustainable measures that improve air and water quality, land use, and energy efficiency. In coordination with this initiative, MSD is partnering with Louisville Metro Government on several green infrastructure demonstration projects in the IOAP.
- **MS4 Program:** MSD will coordinate IOAP implementation with the agencies that share implementation of the MS4 Program—including Metro Louisville government, small cities that handle their own drainage, and the Kentucky Department of Transportation. The MS4 program will draw upon the opportunities identified through the green infrastructure analysis conducted by MSD’s IOAP technical team and the ideas suggested by WWT members during the development of the IOAP. MSD further anticipates implementing demonstration projects, such as rain gardens in the separate sewer area, under the MS4 as part of a coordinated effort with the IOAP to test and evaluate green infrastructure approaches to wet weather management.

The IOAP—as part of MSD’s wet weather consent decree response—will be a federally enforceable action plan for sewer overflow abatement. Although many IOAP projects and programs will provide multiple benefits to the community, the scope of the IOAP is limited to commitments that directly relate to MSD programs and activities to address combined sewer overflow (CSO) and sanitary sewer overflow (SSO) issues. Other community water quality programs, which may be partly or completely out of MSD’s control, can provide synergistic benefits with the IOAP, but they do not fall under the same federal enforcement. These programs may, however, have different mechanisms for ensuring accountability (e.g., the State of Kentucky oversees the MS4 stormwater permit that MSD and several other agencies hold). As noted above, MSD anticipates coordinating IOAP implementation with the water quality improvement initiatives of Louisville Metro Government and other public and private entities, even though these broader initiatives may not explicitly be part of the IOAP.

Values-Based Performance Evaluation Framework Used to Develop the IOAP

MSD developed the IOAP using a values-based performance evaluation framework established by the Wet Weather Team. This analytic framework includes both a robust benefit-cost scoring methodology for evaluating and selecting project alternatives and a systematic process for evaluating the IOAP programmatically. The Wet Weather Team identified and agreed upon the following eleven community values that underpin the analysis and selection of alternatives for the IOAP.

¹ More information about these initiatives is available on the following websites: Go Green Louisville (www.louisvilleky.gov/GoGreen), Partnership for a Green City (www.partnershipforagreencity.org), and MS4 program (www.msdlouky.org/insidemsd/wwwq/ms4).

Project-Specific Values

- Asset protection
- Eco-friendly solutions
- Environmental enhancement
- Public health enhancement
- Regulatory performance

Programmatic Values

- Customer satisfaction
- Economic vitality
- Education
- Environmental justice and equity
- Financial equity
- Financial stewardship

Using the structured decision-making process as framed by the Wet Weather Team, MSD developed and evaluated overflow abatement control options for the IOAP based on managing risks to these community values. In particular, MSD's technical team analyzed each project alternative considered for the IOAP in terms of potential benefits and costs, where "benefits" are quantified based on the anticipated reduction in risks to the community values and "costs" reflect the total capital and operational costs of the alternative. The benefit-cost analysis influences the selection of site-specific abatement approaches or technologies, site-specific levels of protection (within the boundary conditions for CSOs and SSOs described below), and the relative priority of projects for implementation.

Several of the Wet Weather Team's community values relate to financial considerations, including the cost-effectiveness of individual solutions and the program as a whole (financial stewardship), the affordability of the program's total costs for the community (economic vitality), and how the costs are allocated among different segments of the population (financial equity). The Wet Weather Team has used the results of the values-based benefit-cost analysis of project alternatives to provide context to discussions about the appropriate level of investment in the IOAP.

The WWT's discussions about total program costs and the selection of projects for the IOAP have considered, as directed in EPA's CSO Control Policy, a "knee of the curve" analysis to determine where the increment of pollution reduction achieved in the receiving water diminishes compared to the increased costs. In addition to this analysis, the community's level of investment in the IOAP has been considered in the context of anticipated future requirements and other needs for MSD services, including stormwater compliance needs associated with Metro Louisville's MS4 permit and requirements to meet the forthcoming total maximum daily load (TMDL) allocations for Beargrass Creek. This consideration of other water quality investment needs is important since sewer overflow control alone will not be sufficient to meet water quality standards.

The technical team's analysis of the IOAP according to the WWT's programmatic values yielded the following conclusions.

- **Customer Satisfaction:** The IOAP ensures service continuity by eliminating several small wastewater treatment plants and pump stations and by incorporating redundant equipment and standby generators. Odor control guidelines have been consistently applied across all projects. Most storage basins proposed in the IOAP will be covered. Other storage basin and pump station improvement projects incorporate odor control equipment.
- **Economic Vitality:** MSD's current rates are near the national average. The anticipated annual rate increases of 5–6.5 percent are consistent with initial estimates of program costs, and they include allowances for future MSD programs as well as IOAP implementation. Even with these rate increases, MSD's rates are anticipated to remain at or near the national average, assuming other communities face similar inflation and regulatory pressures. These estimates are based on current data; many unknown factors (e.g., bond market, climate change, etc.) will also affect future rates.

- **Education:** Education is an integral and essential component of the IOAP. It supports a number of IOAP objectives, including promoting and sustaining participation in green infrastructure and source control efforts, and building a sense of personal responsibility and support for clean water initiatives.
- **Environmental Justice and Equity:** The site selection process followed uniform criteria across the county, with most solutions placed near overflow points and with no homes or private businesses permanently displaced. Furthermore, the configuration of facilities was based on a uniform application of written design criteria and odor control criteria. Other nuisance conditions will be minimized during the design and construction phases of projects.
- **Financial Equity:** MSD's rate structure is based on a cost-of-service model tempered by consideration of customers' ability to pay. The rate increases proposed to fund the IOAP and other MSD programs will continue to be based on the cost of service, but MSD will recommend to the Board that the existing low income, senior citizen discount program be expanded. The IOAP also proposes subsidies and incentives for green infrastructure and infiltration and inflow (I&I) control based on their business value for overflow abatement.
- **Financial Stewardship:** As described above, the IOAP is based upon a rigorous benefit-cost analysis that considered a broad range of technology alternatives and different levels of control that met or exceeded regulatory guidelines. The "knee of the curve" evaluations of IOAP projects demonstrated that the IOAP provides a high level of control, but does not exceed the point of diminishing returns.

Control Levels for Combined Sewer Overflows and Sanitary Sewer Overflows

Under the Clean Water Act, CSOs are permitted discharges in wet weather, as long as they are managed to avoid degradation of water quality in the receiving streams. EPA's CSO Control Policy² sets specific abatement targets for CSOs. To be permitted, wet-weather CSOs must be controlled so that either water quality standards are achieved or the permit-holder can show that the CSO discharges do not cause or contribute to exceedances of water quality standards. Based on EPA's CSO Control Policy, EPA may respond to MSD's proposed strategy for controlling wet weather CSO discharges indicating a need for a temporary variance or suspension of water quality standards during wet weather. Variances are temporary, not permanent, solutions to achieve compliance with the Clean Water Act. As stated in EPA's CSO Control Policy, variances are reviewable generally every three years.

CSO projects in the IOAP have the following levels of control:

- 6 projects result in no overflows in a typical year; these locations would only overflow as a result of very large storms.
- 1 project would result in four overflows per year in a typical year.
- 11 projects result in eight overflows per year in a typical year.

MSD's strategy for SSO control reflects the fact that SSOs, unlike wet-weather CSOs, are unauthorized discharges that must be "eliminated" under the Clean Water Act. In the IOAP, the values evaluation framework has been used to evaluate a range of site-specific design storms to establish the appropriate level of control of SSOs. Consistent with an analysis of sixty years of historical weather patterns for Jefferson County, the IOAP uses a three-hour "cloud burst" storm, with a statistically anticipated rainfall of 1.82 inches, as the minimum design storm considered. The Cities of Atlanta, Cincinnati, and Knoxville used similar design storms as the minimum protection level for SSO control. The approach of using the values evaluation framework to determine the SSO control level means that solutions to address certain SSOs have been designed to protect against larger storms (e.g., a 2.25-inch cloudburst storm

² EPA's Combined Sewer Overflow Control Policy is available at <http://cfpub1.epa.gov/npdes/cso/cpolicy.cfm>.

instead of a 1.82-inch cloudburst storm) because they yield a higher benefit-cost ratio in the analysis of project alternatives.

SSO projects in the IOAP have the following levels of control:

- 30 projects eliminate overflows up to a 1.82-inch cloudburst storm.
- 9 projects eliminate overflows up to a 2.25-inch cloudburst storm.
- 7 projects eliminate overflows up to a 2.60-inch cloudburst storm.

Components of MSD's Integrated Overflow Abatement Plan

Control options in the IOAP (the IOAP “toolkit”) include source control (including green infrastructure and infiltration and inflow [I&I] reduction efforts), storage, conveyance/transport, treatment, and sewer separation. MSD’s technical team has used the benefit-cost tool to compare the project alternatives and program elements considered for inclusion in the IOAP. The specific mix of control options for individual CSO or SSO locations in the IOAP is driven by the benefit-cost analysis of how the project alternatives affect the WWT’s community values and site-specific considerations. Project alternatives are built around MSD’s existing infrastructure (e.g., large diameter pipes and wastewater treatment plants) and draw on synergistic benefits from other MSD projects (e.g., the “Big Four” SSO projects). Furthermore, project budgets include an enhanced site restoration allowance to fund localized opportunities to reduce historical overflow impacts on aquatic and riparian environments near the sites of overflow abatement projects.

Driven by the values-based benefit-cost analysis, the IOAP reflects a balanced mix of green and gray solutions to prevent and control sewer overflows. “Green” solutions include options such as green roofs, rain gardens, rain barrels, porous pavement, and bioretention, while “gray” solutions include options such as storage, treatment, conveyance/transport, and sewer separation. As a guiding principle, MSD’s IOAP has been developed based on front-end consideration of source control and green infrastructure. This means that more traditional “gray” infrastructure in the IOAP has been sized after considering both (1) the anticipated flow-reduction benefits of programmatic and site-specific green infrastructure solutions and (2) the anticipated effectiveness of other source control approaches, including reduction of private sources of I&I. Green solutions in the IOAP will be implemented as soon as possible, to allow data to be gathered on the flow reduction benefits that occur. Prior to the final design of supporting gray solutions, the actual flow reduction performance will be documented and compared against the estimated targets. The final sizing of the gray solutions will then be based on actual documented performance of green solutions, as well as any further green and source control investments justified by performance information. Green infrastructure investments are estimated to reduce the initial costs of CSO gray infrastructure projects by \$40 million; potential future savings could double or triple this figure.

As defined in the IOAP, the 19 gray infrastructure projects to control CSOs include:

- 4 sewer separation projects;
- 13 storage basin projects (This includes in-line and off-line storage; most in-line storage projects have a Real-Time Control component.);
- Replacement and expansion of the Nightingale Sanitary Pump Station; and
- 1 high-rate wet weather treatment project (screening, settling, and disinfection).

The 46 gray infrastructure projects to control SSOs in the IOAP include:

- 15 conveyance capacity upgrades and interceptor relief projects;
- 19 storage projects (in-line and off-line storage, many with pipe upgrades also);
- 1 sewer replacement project for Beechwood Village (one of the “Big 4 SSOs”);and
- 11 pump station and wastewater treatment plant upgrades, eliminations, or replacements. These projects include expanding the wet weather capacity of the Derek R. Guthrie Water Quality Treatment Center, elimination of 5 small wastewater treatment plants in the Prospect area, and potentially the elimination of the Jeffersontown Wastewater Treatment Plant.

The IOAP includes both an annual green infrastructure program and an initial set of green infrastructure demonstration projects. The green infrastructure program is front-end loaded to maximize benefits on downsizing future gray infrastructure. For example, the IOAP project schedule calls for a \$40 million investment in green infrastructure programs and projects during the first six years. Programmatic green infrastructure components in the IOAP include a downspout disconnect program, green roof construction subsidies or incentives, green roads and alleys partnership incentives, and pervious pavement sidewalks and parking. MSD has based the proposed incentives and subsidies on a “business case” analysis of the financial benefit of green infrastructure in terms of costs per gallon of flow removed from the combined sewer system. Through the anticipated green infrastructure partnership, incentive, and education programs, MSD’s initial \$40 million investment in green infrastructure has the potential to leverage \$60 million more from other private and public funding sources, thereby yielding up to \$100 million in green infrastructure projects.

MSD plans to construct a series of new green infrastructure demonstration projects across Jefferson County. The proposed green infrastructure projects in the combined sewer area will be part of MSD’s IOAP, while the proposed green infrastructure projects outside the combined sewer area will be a part of the community’s MS4 stormwater program. These demonstration projects are designed to achieve three main objectives: (1) improve water quality and reduce sewer overflows, (2) provide data on green infrastructure effectiveness, and (3) educate community members about the value and benefits of green infrastructure. All green infrastructure demonstration projects in the IOAP will incorporate a monitoring component, so that the effectiveness of the projects can be tracked over time and regularly reported to regulators and the public. MSD will then use these monitoring results to guide future IOAP implementation, under the IOAP’s adaptive management plan (further described below).

This vision currently reflects a minimum commitment to 18 green infrastructure demonstration projects in the IOAP. These proposed new green infrastructure demonstration projects (which are subject to partnership and regulatory approval) include:

- 6 bioswale and biofiltration projects (e.g., green parking lots and green streets);
- 4 rain gardens;
- 3 pervious concrete alleys; and
- 5 infiltration dry wells.

MSD plans to expand and enhance this proposed suite of demonstration projects in response to feedback from WWT members that the initial projects might not be sufficient to achieve the objective of educating the public and building support for green infrastructure. In particular, MSD will look to enhance the distribution of demonstration projects in Jefferson County (including considering green infrastructure projects in each Metro Council District) and the numbers of individual project types.

MSD’s technical team has analyzed potential options to control private sources of I&I into the sanitary sewer system, including building laterals, downspouts, sump pumps, and foundation drains. This analysis

indicates that private-side I&I control is an essential part of the IOAP, and it will reduce the overall anticipated costs of overflow abatement. The technical team has analyzed options for adopting a requirement for inspections of private properties (e.g., during the property transfer process, when building permits are issued, when contractors install roof and gutter systems, when plumbers connect sump pumps, and/or at other times), along with providing some form of cost share and conducting an aggressive education campaign. MSD will work with Metro Government to support further development and adoption of an ordinance supporting these requirements. Although I&I reduction is particularly relevant to SSO control (since the sanitary sewer system was not designed to accept inflow), it may be useful to have similar requirements for the combined sewer system.

Public Information, Education, and Involvement Program

Education and public involvement are critical to the long-term implementation success of the IOAP. MSD uses the term “Project WIN” (Waterway Improvements Now) to describe its consent decree response activities to the public. The ongoing public information, education, and involvement program for Project WIN is designed to accomplish the following objectives:

1. Generate a sense of personal ownership and responsibility for clean water;
2. Promote and sustain participation in critical voluntary programs in the IOAP, including private-side I&I control and green infrastructure;
3. Promote public acceptance and support for the financial investments required to achieve consent decree and Clean Water Act compliance; and
4. Encourage support for other agency programs or legislation that supports overflow abatement efforts.

To achieve these objectives, the Project WIN education and public involvement program uses a wide range of communication media. In particular, the program includes the following elements:

- Public meetings and community events;
- Enhanced web portal for Project WIN;
- Speaker’s bureau and technical support;
- Print and electronic media (e.g., print advertisements, press releases, targeted brochures and pamphlets, reports, newsletters, billing inserts, public TV video, radio announcements, etc.);
- Recognition programs;
- Demonstration projects;
- Tours, demonstrations, and workshops;
- Enhanced school partnerships; and
- Annual effectiveness monitoring through direct mail and phone surveys.

These public involvement efforts are focused on several key audiences, including the general public, schools and children, and target groups such as property owners, project neighborhoods, builders, and restaurants. Focusing education efforts on children is important to ensure the long-term sustainability of voluntary programs in the IOAP. For the general public, MSD is using five key messages:

1. Value clean water.
2. Your investment is paying dividends, and our water is getting cleaner.
3. Protecting public health is critically important.
4. MSD and many community partners are working hard to improve water quality.

5. You can make a difference in improving water quality.

Post-Construction Compliance Monitoring

MSD's IOAP will use an adaptive management implementation approach based on monitoring and evaluation efforts. MSD's post-construction compliance monitoring and evaluation plan for the IOAP includes: (a) water quality monitoring, (b) sewer flow monitoring, (c) overflow events analysis, (d) gray and green infrastructure project performance monitoring, and (e) measurement of the effectiveness of source control and behavior-change efforts. MSD will prepare both required regulatory and public education reports from these data and adapt the CSO management and SSO elimination approaches based on the monitoring and evaluation results. Adjustments may include recalibrating models, "right-sizing" gray solutions, reevaluating the effectiveness of green solutions, and adjusting the types and characteristics of projects planned for later phases of implementation, including additional investments in green infrastructure and source control beyond those proposed in the initial program. At this time there is recognition that historical weather trends may not be as reliable as in the past due to potential changes in the climate. The IOAP's adaptive management approach will allow MSD to monitor evolving weather pattern developments and adjust its plans as more data become available.

Future Development Considerations

Solutions in the IOAP consider future development based on the community's long-term land-use plan, Cornerstone 2020.³ IOAP solutions are designed to accommodate the anticipated impacts of population growth and land-use development in that the solutions consider the effects of growth on connections to existing infrastructure that is upstream from existing overflow points. The IOAP is not, however, intended to provide capacity for all future growth predicted by Cornerstone 2020. Cases where the growth outlined in Cornerstone 2020 would logically be provided by new infrastructure, and not hydraulically dependent on or connected to the IOAP solution, have not been considered part of the IOAP. In summary, the solutions in the IOAP have been designed and sized to account for the impacts of anticipated growth on existing infrastructure, but the IOAP itself is not intended to build the capacity needed for growth.

MSD's Capacity, Management, Operations, and Maintenance (CMOM) Program, which is part of MSD's Consent Decree response but separate from the IOAP, includes standard operations and maintenance activities practices designed to, among other things, investigate capacity-constrained areas of the sewer system. The CMOM program also includes a System Capacity Assurance Program focused on providing capacity for current and future service needs.

Continued development in the community will require MSD to implement measures to reduce wet-weather flows. MSD will use a three-to-one offset of wet-weather flows from new development. This means that existing flows entering MSD's sanitary sewer systems will be reduced at a ratio of three gallons for every new gallon added. MSD's flow reduction efforts will be designed to correct deficiencies in the existing sewer system in the same geographic areas (sewersheds) of the system affected by the flows from new development. MSD will track flow reduction "credits" to ensure that the flow reductions occur in the appropriate geographic locations to offset the new flows. (This three-to-one offset approach is based on the City of Knoxville's Capacity Assurance Program.) The MSD Board will develop the fee structure for the offset plan.

³ For more information about the Cornerstone 2020 plan, see www.louisvilleky.gov/PlanningDesign/Cornerstone+2020.htm.

Funding Plan

The funding plan for the IOAP is designed to cover the 15-year period over which IOAP capital projects will be constructed to improve MSD's sewer infrastructure to meet the requirements of the consent decree. The IOAP funding plan is based on the following three principles:

- Rates and fees for the IOAP must pay MSD's operating costs and debt service.
- MSD's current bond rating (AA) should, at a minimum, be maintained.
- Rates and fees should allow for continued economic development in the community and a strong local economy.

These principles for the funding plan affect the amount of money MSD may borrow at any one time and the level of increases in rates and fees needed to fund capital and operating expenses for IOAP implementation.

MSD will fund the IOAP primarily through a combination of annual rate increases and bond issues or other loans. MSD also plans to pursue grants, line-item appropriations, and public/private partnerships (e.g., recapture agreements) to help pay for capital construction costs, as appropriate; however, the funding plan is not built around these funding sources since they are less certain. Using the estimate that the consent decree will cost \$843 million in capital expenditures, average bills for residential customers are expected to increase from 5 to 6.5 percent annually through 2021. This means that the average residential bill would increase from \$29.58 in 2008 to approximately \$63.12 by 2024 due to the consent decree capital construction expenses. Along with these rate increases, MSD expects to borrow approximately \$1.25 billion by 2024 based on the estimates of capital costs; this would increase MSD's debt service payments from \$94 million annually to \$163 million annually by 2025.⁴ A mixture of fixed and variable rate borrowings is anticipated. These rate increases and loans would be used to address both IOAP construction costs and other MSD capital needs for infrastructure renewal, replacement, and expansion.

Estimates of IOAP costs appear to be within community tolerance for rate increases; however, the rate increases could nevertheless be difficult for some segments of the population to afford, especially in the context of other expenses. For this reason, the Wet Weather Team has considered potential ways to provide discounts to customers that face financial hardship. In the IOAP funding plan, MSD proposes a few changes to MSD's existing rate structure for the Board to consider. These changes are designed to accomplish two objectives: (1) provide discounts for low-income populations and (2) ensure steady and predictable revenue flows overall. The specific rate structure changes currently under study and reflected in the IOAP funding plan include the following:

- Residential customer billing based on winter consumption;
- Potentially billing customers on a monthly basis (in coordination with the Louisville Water Company).
- Expansion of the senior citizens discount program.

As noted above, MSD will construct the capital projects in the IOAP over a 15-year period, in order to meet the regulatory requirements of the consent decree and achieve compliance with the Clean Water Act. Many of the elements of the IOAP—including the Project WIN education program, operations and maintenance of IOAP projects, and monitoring and evaluation programs—will also continue past the construction phase of the IOAP. MSD is committed to making sure that the IOAP programs and projects provide for long-term improvements in water quality in Louisville and Jefferson County.

⁴ This estimate assumes that interest rates are in the 5 to 6 percent range.