Introduction to Integrated Planning

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Introduction to Integrated Planning

Communities face several challenges when it comes to improving water quality and staying within Clean Water Act (CWA) compliance. Issues include:

- Aging infrastructure
- Growing population
- Limited funding and resources
- Climate change
- Complex water quality issues

However, it can be difficult to address of all these issues at once. This resulted in the creation of the integrated planning framework in 2012. This allows communities to voluntarily develop an integrated plan to address CWA requirements.

Water Infrastructure and Improvement Act (WIIA)

WIIA was enacted on January 14, 2019 included amendments in accordance with the Integrated Planning framework.

Important amendments to municipalities/communities:

- Allows municipalities and communities to modify administrative orders such as consent decrees based on an integrated plan
 - Can also be incorporated into a National Pollutant Discharge Elimination System (NPDES) allowing a compliance schedule to be implemented over multiple permit terms
- Requires permitting authorities to inform communities of the opportunity to develop an integrated plan

Additional benefits of integrated plans

- Communities may also benefit from an integrated plan as it allows them to consider additional benefits to communities as said integrated plan leads to equal or greater water quality improvements. These include benefits pertaining to:
- Environmental issues
- Social issues
- economic issues

Many municipalities and wastewater utilities that developed integrated plans have gained:



Faster water quality improvements and health protections.



More cost-effective and affordable infrastructure investments.



Consideration of investments that support other community objectives.



Innovative long-term solutions that reduce pollution sources rather than just controlling or treating discharges.

Points of emphasis

- Integrated planning should not be viewed as the ability to change existing regulatory requirements.
 - It instead focuses on encouraging and providing clarity on using regulatory flexibility. This regulatory flexibility is so that communities are better able to prioritize their requirements and find more effective and sustainable solutions to solving water quality issues.
- Communities are tasked with developing integrated plans and is not the responsibility of permitting authorities
- Innovative technologies are encouraged
 - Green infrastructure specifically

Basic Elements of Integrated Planning



1. A description of the water quality, human health and regulatory issues the plan addresses.



2. A description of existing wastewater and stormwater systems in the plan and how they currently function.



3. A process for continuous stakeholder engagement during the planning process and during plan implementation.



4. A process for choosing alternatives and proposing implementation schedules.



5. A process for measuring the success of an implemented alternative.



6. A process to improve the plan over time by choosing new or modified projects and implementation schedules.



Communities should begin with a description of water quality, human health, and regulatory issues needed to be addressed. Communities also address and identify:

- sensitive areas and environmental justice concerns within their system.
- Metrics for evaluating and meeting human health and water quality objectives

By establishing minimum water quality and human health goals are needed to reach, communities can develop a minimum funding requirement for a baseline project alternative.



Element 2: Scoping relevant systems

Identify relevant systems that will be included in your integrated plan, which may include drinking water, wastewater, and/or stormwater.

Assess the baseline performance of your system your wastewater and stormwater system. Asset management plays a key role in this element by assisting in identifying the condition of your system(s).



Element 3: Involving stakeholders

This involves creating channels of communication with community stakeholders in order to give a full consideration of views into the integrated plan. Which may include:

- Public meetings
- Online educational resources
- Printed educational resources
- Community committees
- Actively engaging with representatives of minority communities

By identifying, planning an engagement strategy, and engaging with stakeholders, you will be able to develop important priorities and goals of stakeholders to be considered during the integrated planning process.



Element 4: Evaluating Options



Element 4 focuses on incorporating established goals and objectives of the Integrated Plan to evaluate and choose from various alternatives. This process results in the selection of the preferred alternative and the finalization of the implementation schedule for the chosen alternative.



Evaluating and Establishing Criteria



Stakeholder Opportunity

Involving stakeholders in evaluation of criteria is a good opportunity to ensure community priorities are included in your integrated plan

- Should include typical criteria such reduction in pollutants
- Criteria could also include priorities that reflect community and sustainability goals related to environmental, social, and economic issues ("Triple Bottom Line")



Establishing Alternatives

- Establish alternatives that meet the set criteria
- Form alternatives by pairing different projects and implementation schedules and comparing the relative costs and benefits
- Propose alternatives that produce the same or better CWA outcomes



Using CWA to form the basic requirements can serve the foundation as a plan. Alternatives may achieve these baseline goals in different ways, and meet those goals set out in Element 1.



Evaluating Alternatives

Applicable Analyses

<u>Quantitative</u>

- Quantifying benefits using:
 - Water quality impact modelling
 - Cost-benefit analysis
 - Costeffectiveness analysis

<u>Qualitative</u>

Used for evaluating benefits that are hard to quantify

- Will the alternative:
 - Garner public support?
- Support disadvantaged communities?
- Etc.

<u>Multi-criteria</u> <u>Decision Making</u>

- Combination of qualitative and quantitative analysis
- Allows the ability to weight evaluation criteria

- Evaluate the set of alternatives on how they meet your selected criteria
- Justify choice of alternatives and implementation schedules
- This may include conducting both qualitative and quantitative analyses



Financial Capability and Strategy

- Establish the life cycle cost of each alternative to identify necessary level of investment
- Identify opportunities for cost savings and costsharing programs
- Identify funding opportunities for wastewater and stormwater projects
- Assess affordability of rate increases that may be necessary in order to fund projects included in the integrated plan



Incorporating Asset Management

Using the characterization of systems included in integrated plan to conduct life cycle costing and further understand the level of financial investment needed.



Element 5: Process for Measuring Success

Once a community has chosen a given project alternative, it is then measured for its performance relative to the criteria outlined in the integrated plan. Communities typically develop, but are not limited to:

- Evaluations of green infrastructure or other innovative technologies
- Monitoring programs
- 5-year action plan

Establishing the success of a project depends on the criteria selected to measure the success. Evaluating the program can then be done by evaluating the effectiveness of the projects in relation to the criteria.



Element 6: Process for Improving Plan

Element 6 recommends that communities making modifications to their integrated plan based on performance evaluation of projects in relation to their criteria. This typically involves a reoccurring review process, financial conditions, modeling or monitoring data, etc.

Develop a process for improving the plan given the measuring of success in Element 5. Improve your plan based on information gathered in Elements 1-5.

Case Study: Columbia, Missouri



Columbia, Missouri A Great Place to Live, Work and study









Columbia #9 on Profascinate's list of Top 10 Best College Towns in America | March 2017 America's Most Artistic Towns from Expedia Viewfinder | February 2017 The best cities to start a business in 2017 – #5 Columbia | February 2017 Redbox identifies America's most romantic cities – #6 Columbia | February 2017 Second best place for working women from CNBC and SmartAsset | November 2016 Columbia made FlipKey's list of 6 amazing small cities for a family vacation | November 2016 CBS News listed Columbia among the 25 best cities to live in | 2016 Columbia is #42 on the 50 Best Bike Cities of 2016 | September 2016 PureWow's The 19 Best College Towns in America | August 2016 Business Insider's The 30 Best College Towns in America – #15 Columbia | July 2016

Top Employers

- University of Missouri Finance
- Colleges
- Healthcare
- Insurance

Industry
 Government & Schools

CHALLENGES FACING CITY

- Draft Administrative Order
- Columbia Wastewater Treatment Plant NPDES Renewal
 - Ammonia
 - Bacteria
- Bacteria TMDLs
- Aging Infrastructure









Why an Integrated Management Plan?

- Meet multiple demands with limited resources
- Align investments with community priorities
- Ensure effective wastewater
 & stormwater operations
- Improve water quality and meet regulatory requirements



Integrated management planning process



Identify and describe the issues









Aging Infrastructure

Sewage Overflows

Sewage Backups











Flooding

Road Failures

Stormwater Pollution Regional Treatment

Community outreach program









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Get Involved Plan Outcomes Address aging storm & sewer syste Develop sustainable and affordable infrastructure for future generation





lavor Brian Treece





Ward 1 Council Member Clyde Ruffin



Ward 4 Council Member Ian Thomas



Ward 3 Council Member Karl Skala

Ward 5 Council Member Matt Pitzer

Ward 6 Council Member Betsy Peters

Extensive outreach key to building community support

Online Survey – Identify Issues

Workshop 1 – Existing System Challenges

Workshop 2 – Prioritize Watersheds

Workshop 3 – Prioritize Evaluation Criteria

Workshop 4 – Alternatives

45-Day Comment Period – Report Feedback

Public Hearing and City Council Meeting



Successful integrated plans balance community priorities with affordability

What is our priority?	 Utility drivers Regional priorities Community enhancement
How do we decide?	 Structured project prioritization process Triple bottom line
How much we can afford?	Stakeholder supportFinancial capability assessment
When can we afford it?	 Review rate impacts and program delivery over the planning period

Multiple criteria decision analysis framework



Community priorities based on stakeholder engagement

SOCIAL

- Improve Public Health and Safety
- Improve Quality of Life

ECONOMIC

 Provide Sustainable Services for the Future

ENVIRONMENTAL

- Improve Water Quality
- Regulatory Compliance



WEIGHTED COMMUNITY IMP OBJECTIVES

Community priorities based on stakeholder engagement

CRITERIA

Improve Public Health and Safety

Improve Quality of Life

ECONOMIC

SOCIAL

Provide Sustainable Services for the Future

ENVIRONMENTAL

Improve Water Quality

Regulatory Compliance

SUB-CRITERIA

- Reduced Pathogen Exposure
- Reduced Safety Hazards from System Failures
- Provide Community-Wide Benefits
- Reduce Potential for Property Damage
- Renew Systems Beyond Effective Life
- Improve Services to Underserved and Redeveloping Areas
- Provide Adequate Services to Growing Areas
- Protect or Improve Water Quality in City Streams
- Protect Important Regional Waterbodies
- Meet Clean Water Act Requirements

Evaluate alternative solutions

WASTEWATER COLLECTION

- Sewer Overflows
- System Renewal
- Private Collectors
- Building Backups
- Regional Service
- Maintenance

WASTEWATER TREATMENT

- Constructed Wetlands Improvements
- Wet Weather
 - Improvements
- Nitrification Capacity
- Nutrient Removal
- Chemical Disinfection
- Biosolids Improvements

STORMWATER MANAGEMENT

- System Renewal
- System Assessment
- Flood Control
- Runoff Treatment
- Stream Erosion
- MS4 Programs

Potential funding levels for each project category

- Level 1 Funding Funding needed to <u>meet minimum</u> level of service based on community-wide expectations and meet existing regulatory requirements over <u>20-year planning period</u>
- Level 2 Funding Funding needed to <u>exceed minimum</u> level of service based upon community-wide expectations and <u>more</u> <u>proactively</u> meet existing regulatory requirements
- Level 3 Funding Funding needed to <u>address all</u> forecasted infrastructure needs and <u>evolving</u> regulatory issues within 20-year planning period

Wastewater and stormwater cost estimates

WASTEWATER & STORMWATER TOTAL 20-YEAR PLANNING COSTS IN 2017 DOLLARS



Community benefits for our investments

Meet Clean Water Act Requirements



Optimized investment provides biggest bang for the buck

Wastewater			
Project Category	Level 1	Level 2	Level 3
System Capacity		√	
System Renewal	 Image: A set of the set of the		
Private Collectors	 Image: A set of the set of the		
Building Backups	✓		
Regional Service	 Image: A start of the start of		
Maintenance	 Image: A start of the start of		
Planning	 Image: A set of the set of the		
Nitirification Capacity	 Image: A set of the set of the		
Nutrient Removal	✓		
Chemical Disinfection	 Image: A set of the set of the		
Constructed Wetland		 ✓ 	
Biosolids Improvements	✓		
Wet Weather Improvements		\checkmark	

Stormwater Management				
Project Category	Level 1	Level 2	Level 3	
System Renewal		~		
System Assessment		 ✓ 		
Flood Control		✓		
Runoff Treatment		✓		
Stream Erosion		 ✓ 		
MS4 Program	✓			
Planning	✓			

Optimized investment provides biggest bang for the buck

Incremental Benefit Score per \$100M Investment Balanced 1.00 0.90 0.81 0.79 Prioritized 0.80 0.70 0.60 0.52 Implementable 0.50 0.40 0.32 Affordable 0.30 0.20 0.15 0.10 0.00 Level 1 Optimized Level 2 Level 3 Existing

Optimized Wastewater And Stormwater Bill Projections



Evaluating affordability in critical neighborhoods





Evaluating affordability in critical neighborhoods





US EPA Proposed 2020 Financial Capability Assessment Poverty Indicator

Develop Solutions And Schedule 5-year Action Plan Clearly Defines Integrated Planning Milestones

- •20-Year Plan with 5-Year Updates
- Action Plans to Identify Program:

 $\circ Goals$

- Anticipated Actions
- Targeted Community Benefits
- Aligns with EPA Integrated
 Planning Elements 4, 5, and 6

Columbia 5-Year IMP Action Plan ¹				
Goal	Anticipated Actions	Targeted Community Benefits ³		
S	tormwater Management			
Enhance Public Education and Outreach, Illicit Discharge Detection and Elimination, and Construction Site Stormwater Runoff Control to reduce bacteria, sediment, and trash discharges.	 Continue to develop and distribute public education messages as outlined in the Stormwatwer Management Plan. Hire technician to support MS4 program with focus on IDDE. Conduct streamwalks and outfall inspections in all City streams within 5-year action plan period. Develop map of stormwter outfalls. Update Eronsion and Sediment Control Manual and policiles and procedures. Continue to work with MS4 partners to effectively implement stormwater management program, particularly Minimum Control Measure #4. Continue to work with MS4 partners to implement CAM program to improve Hinkson Creek water quality. 	 Improved water quality in City streams Protect important regional waterbodies Progress towards meeting Clean Water Act requirements Reduced safety hazards from system failures Reduced pathogen exposure 		
Implement renewal program to address failing corrugated metal pipe (CMP) and structures beyond physical effective life.	 Initiate renewal activities as resources and funding allow. Secure additional funding to implement these actions. 	Renew systems beyond effective life Improved water quality in City streams Protect important regional waterbodies Reduced safety hazards from system failures		
	Columb Goal S Enhance Public Education and Outreach, Illicit Discharge Detection and Elimination, and Construction Site Stormwater Runoff Control to reduce bacteria, sediment, and trash discharges.	Goal Anticipated Actions Goal Stormwater Management Continue to develop and distribute public education messages as outlined in the Stormwatwer Management Plan. Enhance Public Education and Outreach, Illicit Discharge Detection and Elimination, and Construction Site Stormwater Runoff Control to reduce bacteria, sediment, and trash discharges. • Continue to develop and distribute public education messages as outlined in the Stormwatwer Management Plan. • Hire technician to support MS4 program with focus on IDDE. • Conduct streamwalks and outfall inspections in all City streams within 5-year action plan period. • Update Eronsion and Sediment Control to reduce bacteria, sediment, and trash discharges. • Update Eronsion and Sediment Control Manual and policiles and procedures. • Continue to work with MS4 partners to effectively implement stormwater management program, particularly Minimum Control Measure #4. • Continue to work with MS4 partners to implement CAM program to address failing corrugated metal pipe (CMP) and structures beyond physical effective life. • Initiate renewal activities as resources and funding to implement these actions.		

Unanimous approval from city council

"Thank you for an impressive report. You've thought of all of the issues and I hope that we can move forward with it."

"I think this whole process has been excellent."

"The optimization approach is great because it aligns with our community priorities and highlights underfunding in the stormwater system."

"The community and stakeholder engagement piece was authentic and well done."

"I appreciate the process that was used and the outreach with the community...we're going to have to pay for necessary improvements and this plan will help support that."



MDNR Letter Of Acknowledgement

March 21, 2019

- MDNR Agrees to Use IMP when Making Future Regulatory Decisions
 References WWTP Permit, SW Permit,
 - and Future Orders
- Periodic Updates and Reviews are Necessary
- If the City does not Implement IMP Actions, MDNR Support Will Cease



The Department's Water Protection Program (WPP) has reviewed the City's IMP and agrees to use it when making future wastewater and stormwater regulatory decisions affecting the City. As decisions related to regulatory schedules will be based on the



Integrated Plan incorporation in NPDES permit July 1, 2020

F. SPECIAL CONDITIONS (continued)

- 8. The permittee shall continue to implement a program for maintenance and repair of its collection system according to the City's Integrated Management Plan, which was adopted by the Columbia City Council, Resolution 198-18 and acknowledged by the Department in a letter dated March 21, 2019. The permittee may compare collection system performance results and other data with the benchmarks used in the Departments' Capacity, Management, Operation, And Maintenance (CMOM) Model located at http://dnr.mo.gov/env/wpp/permits/docs/cmom-template.doc. Additional information regarding the Departments' CMOM Model is available at http://dnr.mo.gov/pubs/pub2574.htm.
- 19. On June 5, 2012, EPA published its Integrated Municipal Stormwater and Wastewater Planning Approach Framework ("Framework"). The stated purpose of the Framework is to assist municipalities on their critical paths to achieving the human health and water quality objectives of the Clean Water Act by identifying efficiencies in implementing requirements that arise from distinct wastewater and stormwater programs, including how to best prioritize capital investments. The City developed the "Columbia Wastewater and Stormwater Integrated Management Plan", dated September 28, 2018. This plan was adopted by the Columbia City Council, Resolution 198-18. This integrated management plan was acknowledged by the Department in a letter dated March 21, 2019. The Department has agreed to use the City's Integrated Management Plan when making future wastewater and storm water regulatory decisions affecting the City.
 - (a) The Integrated Management Plan outlines anticipated schedules for the following long-range management actions and investments:
 - (1) Wastewater treatment improvements
 - (2) Wastewater collection system capacity, renewal, and maintenance
 - (3) Stormwater management
 - (b) The Integrated Management Plan includes a 5-year action plan that guides the City's implementation activities.
 - (c) The City will provide the Department with an implementation progress report annually, by November 28th, for the previous City fiscal year. The report shall be submitted to the Missouri Department of Natural Resources, Water Protection Program, Attn: Integrated management Plan Coordinator, PO Box 176, Jefferson City, MO 65102. The report will include the following:
 - (1) Implementation activities performed during the prior year;
 - (2) Any proposed updates to the Integrated Management Plan; and
 - (3) Implementation activities planned for the following year.

	STATE OF MISSOURI
DEPAR	TMENT OF NATURAL RESOURCES
1.6	MISSOURI CLEAN WATER COMMISSION
MISSOU	RI STATE OPERATING PERMIT
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Integrated plan regulatory benefits

- Wet Weather Issues Addressed
- Columbia Wastewater Treatment Plant Reasonable Ammonia Monitoring Requirements
- Columbia Wastewater Treatment Plant Chemical Disinfection Reprioritized
- Bacteria TMDL Development Rescheduled from 2018 to 2024
- Local Control of Projects and Priorities
- Regulatory Certainty Means Rate Stability

Integrated plan infrastructure benefits

ASSESS Condition of System, the Next Step of Asset Management



FOCUS Limited Funding on Renewal of Existing System



IMPROVE Existing Systems to Benefit Water Quality



ENHANCE Public Support by Making Meaningful and Cost-Effective Improvements

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