



Chicago Metropolitan Agency for Planning

233 South Wacker Drive
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Wastewater Committee

Agenda Item No 4.1

Date: December 10, 2014

CMAP Water Quality Review #: 14-WQ-067

Applicant: City of McHenry

Re: The City of McHenry has requested an amendment of state and areawide water quality management plans to consolidate the McHenry Central and South Wastewater Treatment Plants (WWTP) and to decommission the McHenry Central WWTP.

Based on the policies and recommendations of the *Areawide Water Quality Management Plan for Northeastern Illinois*, the *Illinois Water Quality Management Plan*, local government and agency comments, comments received from various interested and affected parties, and staff's analysis, staff recommends a recommendation of *"Support"* for the proposed amendment request.

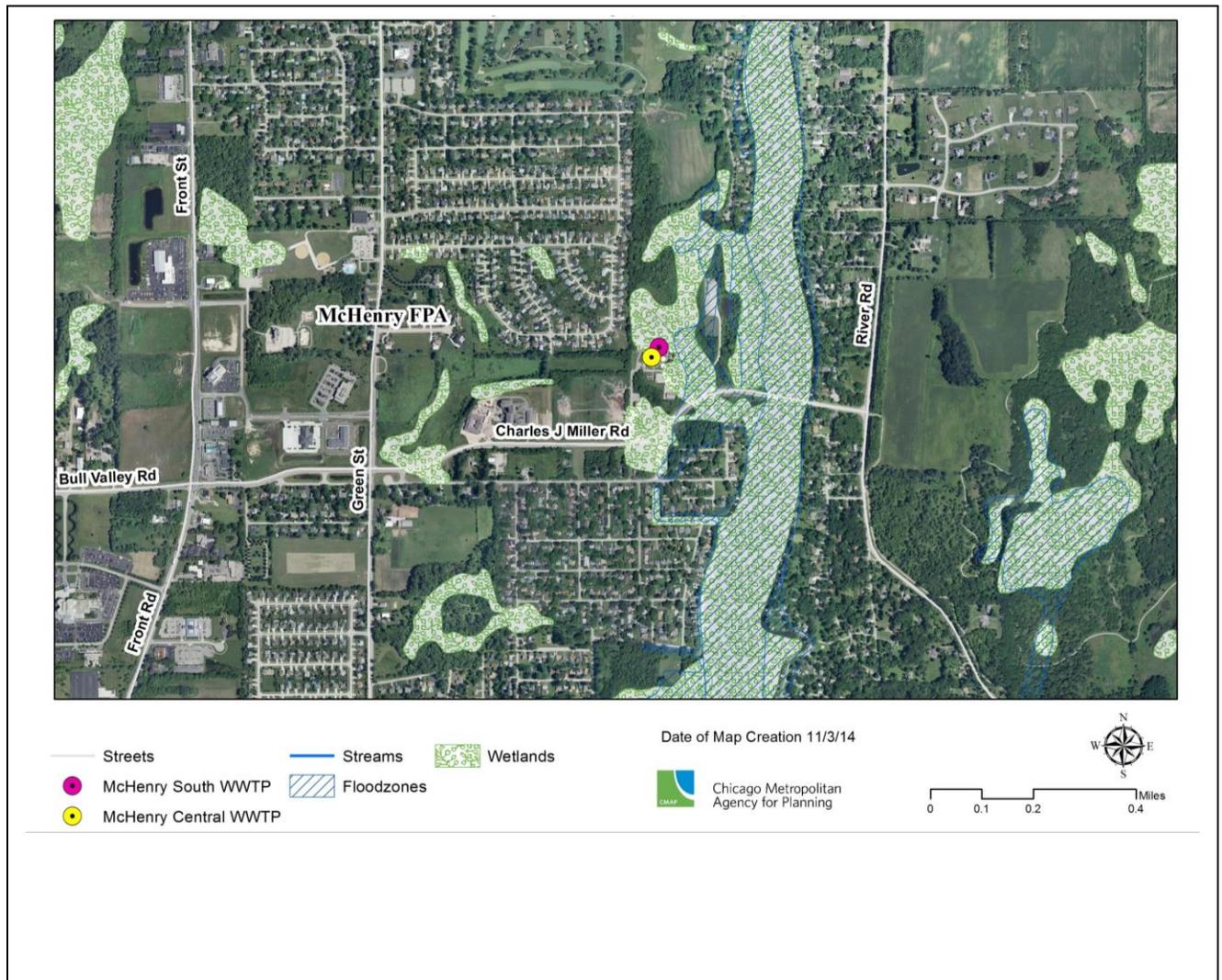
Important Note: CMAP is the designated areawide water quality planning agency and the advisory comprehensive regional planning agency for northeastern Illinois. Therefore, CMAP needs to act as a consensus builder by promoting sound planning principles and practices. Though not specifically required by the Illinois Environmental Protection Agency (IEPA), Criteria Nos. 6 – 9 specifically address CMAP's regional role and promote sound planning.



A. REQUEST SUMMARY

The City of McHenry's request includes consolidation of its 1.5 mgd South WWTP and its 3.0 mgd Central WWTP. As part of the consolidation, the Central WWTP will be decommissioned and all wastewater flows directed to the South WWTP. Both WWTPs are located in the City of McHenry, McHenry County.

Map of WWTF's Site





RELATIONSHIP TO RECOMMENDED CRITEIRA FOR FACILITY PLAN AMENDMENTS

The City of McHenry is the designated management agency for the McHenry Facility Planning Area. The City currently owns and operates two wastewater treatment plants: the 3.0 mgd Central WWTP and the 1.5 mgd South WWTP. Both wastewater treatment plants discharge into Segment DT-23 of the Fox River.

The 1979 *Areawide Water Quality Management Plan for Northeastern Illinois* stated the following for the McHenry Facility Planning Area.

The City of McHenry owns and operates the only municipal type wastewater treatment plant in the McHenry FPA. The McHenry FPA Needs Analysis report recommends that McCullom Lake construct a sewer collection system to be served by an interceptor extended from the McHenry sewer system and a new 0.25 mgd interim sewage treatment plant. It was suggested that both of these projects be implemented as soon as possible, perhaps by 1980. The report also recommended that the City of McHenry expand its plant to 3 mgd at the existing site, probably by 1985. The report further suggests that, in 1985, the wastewater needs of the area be reexamined to determine whether the McHenry Shores plant should be expanded to a regional facility, or whether a new regional plant should be constructed on the east side of the Fox River and the McHenry Shores plant be phased out. The new regional plant, either at McHenry Shores or on the east side of the Fox River, would have a capacity of 3.5 mgd, giving the McHenry FPA a total treatment capacity of 6.5 mgd.

Review Criteria and Staff Analysis Results

Table with 2 columns: Review Criteria and Staff Analysis, Results. Row 1: 1. 'The proposed facility amendment must be designed to meet the State of Illinois water quality standards for the receiving waters and the appropriate discharge standards, or must receive a variance from the Illinois Pollution Control Board.' Consistent. Row 2: Wastewater flows for the City of McHenry are treated at the City's existing Central and South WWTP's located in the central downtown area of the City of McHenry. The Central WWTP was constructed in the 1940s, expanded in the 1970s and renovated in 2006. The Central WWTP is designed to treat 3.0 million gallons per day (MGD) of wastewater and a maximum of 7.5 mgd. The existing South WWTP was constructed in the 1980s, expanded in the 1990s and received recent upgrades in 2011. The South WWTP is designed to treat 1.5 mgd of wastewater per day and a maximum of 4.2 mgd. Discharge monitoring reports indicate that both treatment plants are currently meeting their National Pollution Discharge Elimination System (NPDEES) permit limits. Abandonment of the Central WWTP is proposed since it is expected the WWTP will not effectively meet is current and future permit limits and costs to upgrade the plant's treatment process are cost prohibitive. In addition, the Central WWTP has no provisions for nitrogen or



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phosphorus removal, while the South plant does. Proposed improvements at the South WWTP include: a new pump station; a 24" forecmain extension between the Central and South WWTPs; installation of a South WWTP peak flow system which has the ability to handle a wastewater capacity of 20 mgd of wastewater flow and achieve high removal rates of total suspended solids (TSS) and biological oxygen demand (BOD); effluent filters and UV disinfection; a sludge dryer; and drum screen replacement.

As part of the proposal, the Central WWTP would be decommissioned and all flows diverted to the South WWTP. No net capacity increase is proposed for the South WWTP. Combined the Central and South WWTPs have a current average daily flow of 4.5 mgd and a maximum flow of 11.7 MGD. Improvements to the South WWTP's peak flow system will add additional flow capacity thereby allowing the plant to handle 16 mgd of wastewater flow. The South wastewater treatment process includes a preliminary treatment (screening and raw water pump station) and secondary treatment (oxidation ditch and secondary clarifiers), tertiary treatment with disc filters and UV disinfection and a sludge dryer for solids.

The Central WWTP operates under NPDES Permit No. IL0021067, which expires on January 31, 2017, while the South WWTP operates under NPDES Permit No. IL0066257, which expires October 31, 2015. Both the Central and South plant's NPDES permits include a 20 milligrams permit liter (mg/L) limit and a carbonaceous biological oxygen demand (CBOD) limit and a 25 mg/L. The South WWTP includes more stringent limits including a 1.0 mg/L phosphorus limit and a 1.5 mg/L ammonia nitrogen limit applicable from March through October. More stringent limits will thereby decrease nutrient loadings to the receiving stream.

Both the South and Central WWTPs discharge into Segment DT-23 of the Fox River. The 7Q10 flow for the Fox River is 92 cfs. The stream segment of the Fox River receiving discharge is classified as an impaired waterbody by the IEPA. Therefore, it is included on the Illinois Section 303(d) list. The Fox River impairments in this stream segment are for aquatic life, fish consumption, primary contact, secondary contact and aesthetic quality. Potential causes for the impairments: alteration in stream-side or littoral vegetative covers; chloride; copper; other flow regime alterations; sedimentation/siltation; aquatic algae; polychlorinated biphenyls; and fecal coliform. An Upper Fox River/Flint Creek Watershed Total Maximum Daily Load (TMDL) Stage 1 Report has been developed for Upper Fox River including segment DT-23. As part of the report, more stringent discharge limits will be imposed on the City's NPDES permit to ensure protections of the Fox River upon permit renewal.

2. *"The population and employment for which the proposed amendment is designed must fall within the twenty year forecast most recently adopted by the Commission for the facility planning area or the Commission may agree to adjustments within the regional forecast total."*

Consistent



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<p>The City's existing FPA service area includes 17,000 acres with a population of 26,992 in 11,555 households. The amendment request does not include expansion of its service area therefore, no increase in population projections is proposed. CMAP's 2040 household population equivalent forecast for the City of McHenry is 18, 176 and its population forecast is 48,806. The City's population projections fall well within CMAP's forecasts.</p>	
<p>3. <i>"The applicant must demonstrate that the unit of local government granting zoning to the project formally accept financial responsibility for the wastewater treatment system in the event of a system malfunction or failure. Such acceptance must be in the form of a resolution from the unit of government granting zoning."</i></p>	<p>Not Applicable</p>
<p>The requested amendment does not involve the construction, operation or modification of a privately-owned treatment facility.</p>	
<p>4. <i>"The proposed amendment should not reduce the effectiveness of the water quality improvement strategy contained in the original plan, either for point or nonpoint source control."</i></p>	<p>Consistent</p>
<p>Point Source Impacts (See analysis under Criterion #1) Nonpoint Source Impacts The amendment request is subject to the McHenry County's nonpoint source protection ordinances which have provisions for storm water management, soil erosion and sediment control, and floodplain management. While the ordinances are generally consistent with CMAP's Model Ordinances for stormwater management, soil erosion and sediment control, floodplain management and stream and wetland protection, there is one inconsistent provision within the stream and wetland ordinance.</p> <ul style="list-style-type: none"> Does not designate a minimum 75 foot setback zone from the edge of identified wetlands and waterbodies in which development is limited to the following types of activities: minor improvements like walkways and signs, maintenance of highways and utilities, and park and recreational area development. <p>The City provided a wetland map which identified wetlands within the vicinity of the WWTPs. The City's request will not include, require or result in modification of the wetlands.</p> <p>According to the City's amendment application, it has yet to conduct an Illinois Department of Natural Resources (IDNR) Endangered Species Protection and Natural Areas Preservation Review for the project site. Staff recommends that a consultation be initiated with the IDNR prior to improvements being made at the WWTP.</p> <p>The National Flood Insurance Rate Map reveals that both the Central and South WWTPs are adjacent to a floodplain. Protection provisions for the floodplain are provided under the City's</p>	



<p>nonpoint source protection ordinances.</p> <p>STAFF RECOMMENDATION: Staff requests that the City of McHenry initiate an IDNR Endangered Species and Natural Areas Preservation Review for the request prior to improvements being made at the site.</p>	
<p>5. <i>“The proposed amendment should not adversely affect the cost-effectiveness of the Areawide Water Quality Management Plan for meeting water quality standards in the facility planning areas as a whole.”</i></p>	Consistent
<p>The City of McHenry provided two wastewater treatment alternatives and cost evaluations associated with each. A description of each alternative is provided below. In the long-term, each alternative included abandoning the existing Central WWTP since most of the system components have reached the end of their useful life.</p> <ul style="list-style-type: none"> • Alternative No. 1: Immediate consolidation of the McHenry Central and South WWTPs. • Alternative No. 2: Maintain existing McHenry Central and South WWTPs and consolidate in the future. <p><u>Alternative 1</u></p> <p>Under this alternative, McHenry South and Central WWTPs would be consolidated and the Central plant decommissioned. Treatment processes at the South WWTP would be expanded and upgraded to handle all influent wastewater flows from the Central WWTP. In addition to the expansion, the South WWTP will be upgraded to include: a central regional pump station; a 24 peak flow force main installed between the Central and South WWTP; construction of a new peak flow pump station thereby allowing flows greater than 4 mgd to be pumped to the proposed peak flow treatment system; effluent filters and UV disinfection to increase plant performance, increase dissolved oxygen in the effluent prior to discharge to the Fox River and assist with NPDES permit compliance; an upgraded sludge drying system to allow for Class A sludge and decrease the quantity of sludge disposal; drum screen replacement designed to remove 40% total suspended solids (TSS) and 20% biological oxygen demand; two wastewater reuse systems and an additional reuse pumping system; and a peak flow system to increase removal rates of TSS, BOD, phosphorus and nitrogen. Costs for this alternative total \$25,496,300 and include a 10% contingency. This option will be funded with an IEPA Revolving Loan, with current interest rates, and the ability of the City to reuse the site of the Central WWTP. This is the City’s preferred alternative.</p> <p><u>Alternative 2</u></p> <p>Under this alternative, consolidation of the Central and South WTTTP would be delayed and both plants would operate as two separate entities. Costs associated with this alternative total</p>	



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<p>\$35,496,300. This alternative was dismissed since higher interest and construction costs would be incurred and State Revolving Loan funding would be impacted. Maintenance costs would also increase at the aging Central WWTP.</p>	
<p>6. <i>“The proposed amendment should have the endorsement of the designated management agency for wastewater treatment and substantial support by the municipalities within the affected facility planning area.”</i></p>	<p>Consistent</p>
<p>The City of McHenry is the designated management agency for and the only municipality within the McHenry FPA. The McHenry City Council approved to consolidate the Central and South WWTPs at its February 17, 2014 Meeting.</p>	
<p>7. <i>“The proposed amendment should not adversely affect adjoining units of government.”</i></p>	<p>Consistent</p>
<p>Staff has not received a letter in support or objection to the City of McHenry’s request to consolidate its South and Central WWTPs.</p>	
<p>8. <i>“The proposed amendment should be consistent with other county and regional or state policies, such as the Governor’s Executive Order #4 on the preservation of agricultural land.”</i></p> <p><u>Illinois Department of Agriculture</u></p> <p>To date, Staff has not received an Illinois Department of Agricultural (IDOA) letter in support of nor objection to the City’s request. However, email correspondence from John Lohse of the IDOA to CMAP Staff indicates the request appears to comply with IDOA’s Farmland Preservation Act. A formal letter approving the request is pending.</p> <p><u>Regional Comprehensive Plan - GO TO 2040</u></p> <p>GO TO 2040 recommends that local governments seek ways to increase efficiencies by streamlining and/or consolidating services offered to residents. The City’s request to consolidate its WWTPs is synonymous with regional objectives.</p>	<p>Consistent, Pending IDOA approval</p>
<p>9. <i>“Consideration will be given to evidence of municipal or county zoning approval and commencement of development activity prior to Area-wide Water Quality Management Plan adoption in January 1979.”</i></p>	<p>Not Applicable</p>