



# CITY OF TOPEKA

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Office of Utilities and Transportation  
Department of Public Works  
620 SE Madison St, Unit #12  
Topeka, KS 66607  
[www.topeka.org](http://www.topeka.org)

Braxton Copley, Director  
Email: [bcopley@topeka.org](mailto:bcopley@topeka.org)  
Tel: (785) 368-0911  
Fax: (785) 368-0918

December 9, 2011 - *Corrected Comments*

Kale Horton, Regulatory Project Manager  
US Army Corps of Engineers  
Kansas City Regulatory Office  
635 Federal Building  
601 East 12<sup>th</sup> Street  
Kansas City, Missouri 64106-2896

Re: Kansas River (Sand) Dredging Permits – Comments

Dear Mr. Horton,

On behalf of the Office of Utilities and Transportation (OUT) for the City of Topeka, please consider the following comments concerning the proposed dredging activities on the Kansas River pursuant to the US Army Corps of Engineers Public Notice dated November 9, 2011.

The City has two surface water intakes for drinking water supply at about river mile 87.1 on the Kansas River. The Kansas River is the sole source of potable water supply for the City of Topeka and the City provided water to surrounding Rural Water Districts which serve customers located in Shawnee, Jackson, Wabaunsee, Osage, Douglas and Jefferson counties. The total population served is approximately 175,000 plus many industrial, commercial and public agencies.

Under the new dredging permit application related to 2011-1463, the applicant requests to reopen the currently closed reach from 90.1 to 91.6. This reach was previously closed due to unacceptable degradation during analysis of previous channel cross-section surveys. OUT asks that under 2011-1463 the currently closed reach from river miles 90.1 to 91.6 NOT be reopened to commercial dredging.

The Kansas Department of Wildlife and Parks (KDWP) are funding a study of private in-channel dredging operations on the Kansas River (and other rivers in the state) which is being carried out by Kansas State University researchers. Preliminary results suggest and document that riverbed incision in dredged reaches contributes to excessive bank erosion both upstream and downstream from the dredge sites.

The referenced study by Kansas State University preliminary results show that in-channel dredging will propagate both upstream and downstream from the dredge site until a hard control point (like a river-wide weir or dam or rock outcrop) is reached. OUT has a weir structure in the Kansas River to direct water to our intakes. They further have found that the deep dredge holes



can migrate up and down river and ultimately (depending upon proximity to) may impact critical structures like water intakes, bridges, weirs and dams. The researchers have noted that the 'head cut' can migrate both up and downstream from the dredge site(s) and thereby may result in challenging the integrity of critical structures in and along the river due to the migrating head cut.

OUT believes that the buffer zone is necessary to protect the water quality of its water sources and to protect the facilities structural integrity. OUT further believes that the limitations in the 1991 Regulatory Plan concerning channel degradation to NOT more than 2 feet per 5-miles or else dredging will be required to cease in that reach is critical to OUT's facilities.

OUT believes that an EIS/Regulatory Plan dating to 1991 does not fully address the full affects to the flora and fauna within and adjacent to the Kansas River and its tributaries. In particular, because of the US Army Corps of Engineers reservoirs at Milford and Tuttle, huge water releases occur from time-to-time for flood control. These large release volumes have significant impacts on sand and sediment transport that are exacerbated by the in-channel dredge holes created from dredging operations. This can result in significant degradation of water quality for our two raw water intakes, adding chemical cost increases for successful water treatment.

As a holder of a Kansas Water Pollution Control MS4 permit under the National Pollutant Discharge Elimination System (NPDES) that is charged with regulating and limiting pollutants to the Kansas River which includes suspended solids (sediment), we are opposed to the issuance of this permit for dredging without adequate protection for water quality.

I appreciate the opportunity to provide the Corps with input on this vital matter and respectfully request the US Army Corps of Engineers to require that all Kansas River dredging operations conform to buffers based on K.A.R 5-46-3, subsection c.2.B, General Permits:

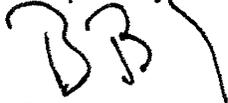
(c) All sand and gravel operations covered by this regulation shall meet the following criteria:

(2) A sand and gravel removal operation shall not be located within the following distances of a bridge, pipeline, cable crossing, levee, or other feature, except when the written permission or easement of the owner of the bridge, pipeline, cable crossing, levee, or other feature is obtained by the applicant, and a written waiver is granted by the chief engineer:

- (A) 50 feet of the banks, or in the channels of the Missouri, Kansas, or Arkansas Rivers, and 50 feet of the banks, or in the channels of their tributaries, for ½ mile upstream from the mouth of the tributaries;
- (B) one mile of a public water supply intake;
- (C) 500 feet of a bridge;
- (D) 300 feet of a buried pipeline or cable crossing; and
- (E) 200 feet of a levee or other feature subject to damage.

(3) Stockpiles of material shall be located in a manner that does not affect the flow of water on the property of any other landowner.

Respectfully submitted,



Braxton Copley, Esq – Director  
Office of Utilities and Transportation  
City of Topeka Public Works Department

Cc: Randy Speaker, Director of Public Works, City of Topeka  
Daniel Stanley, Interim City Manager, City of Topeka



December 9, 2011

Sent via email on 12/9/11

Kale Horton, Regulatory Project Manager  
U.S. Army Corps of Engineers  
Kansas City Regulatory Office  
635 Federal Building, 601 East 12th Street  
Kansas City, Missouri 64106-2896

RECEIVED  
REGULATORY BRANCH  
2011 DEC 15 AM 11:37

Re: Comments on the Proposed Dredging Activities for the Kansas River

I am Tom Schrempp, Director of Production for WaterOne (Water District No. 1 of Johnson County, Kansas) and am submitting on behalf of WaterOne the comments below concerning the Proposed Dredging Activities on the Kansas River pursuant to the Corps of Engineers Public Notice dated November 9, 2011.

WaterOne has surface water intake for drinking water supply at river mile 15 and 21 water wells located adjacent to the river from about river mile 13 to 14. WaterOne is a drinking water utility supplying over 400,000 persons primarily in Johnson County, Kansas.

WaterOne asks that the requested increase in quantity for 2011-1460, Kaw Valley Companies not be granted. Attached below is a graph of river channel over time in the reach below WaterOne's weir at mile 15 that shows that since extraction has been limited in the early 1990's that the river bottom has begun to stabilize. WaterOne does not believe the data supports increasing the sand extraction rate of this reach of the river. The EIS/Regulatory Plan from 1991 did not consider the impacts dredging might have to WaterOne's 21 ground water wells. Since 1991 WaterOne has come to realize that degradation of the Kansas River has adversely affected the capacity of the wellfield and an increase in sand extraction would likely result in additional loss of well capacity.

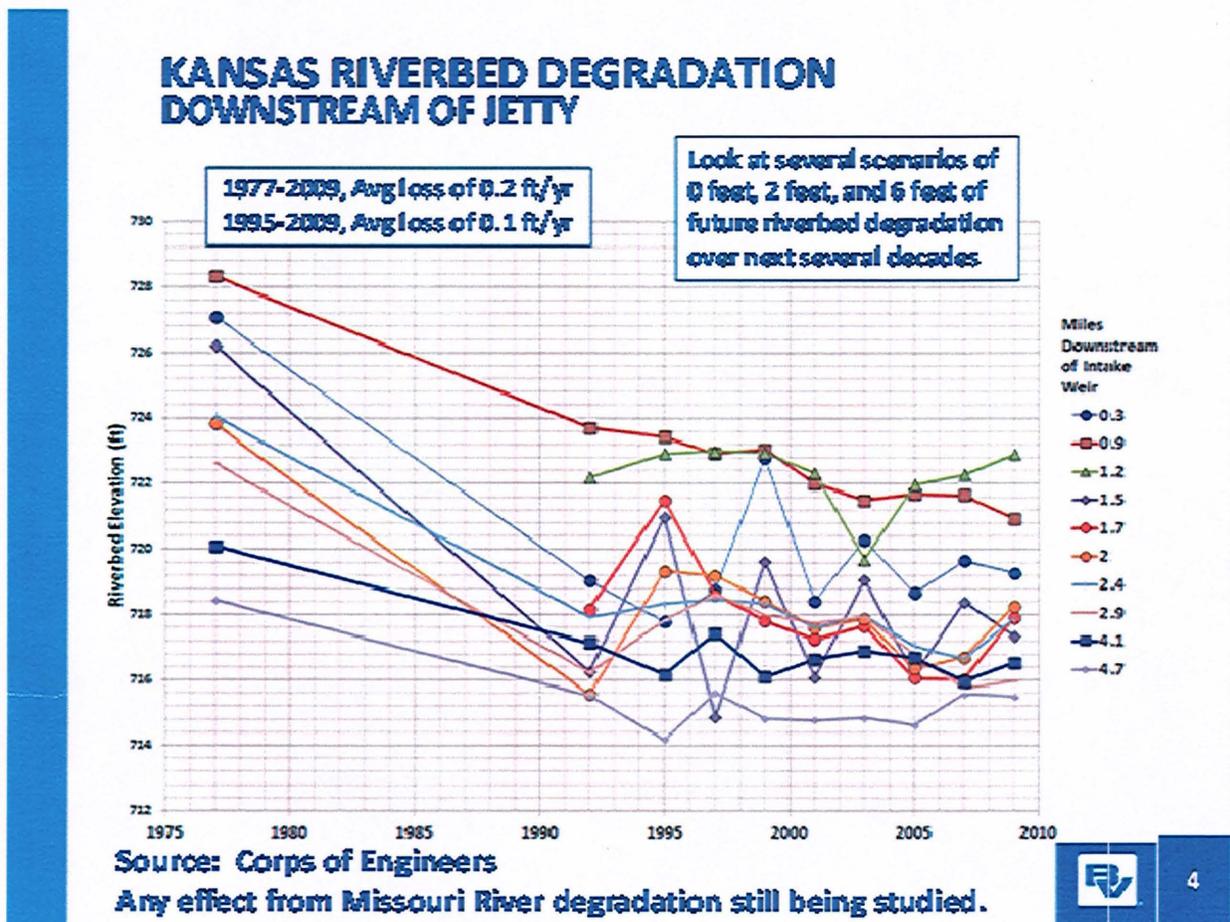
WaterOne objects to 2011-1460 combining the existing permitted reaches into one contiguous reach that crosses the WaterOne weir and intake and the I-435 bridge. WaterOne also asks that the permitting process acknowledge the limits established by K.A.R. 5-46-3, subsection c.2.B, that a sand and gravel removal operation shall not be located within one mile of a public water supply intake. WaterOne believes

and its intake of water through its 21 water wells in the Kansas River alluvium from about mile 12 to mile 14, it believes the dredging should be limited to river miles 9.4 to 10.4 and 16.0 to 16.9.

WaterOne believes the limitations of the Regulatory Plan concerning channel degradation to not more than 2 feet per 5 miles or else dredging in that reach will cease in that reach is critical to protection of WaterOne's facilities.

WaterOne supports the other protective measures for the Kansas River put in place by the Regulatory Plan of 1991.

WaterOne appreciates the opportunity to provide the Corps with input on this vital matter.



K.A.R. 5-46-3, subsection c.2.B

(c) All sand and gravel operations covered by this regulation shall meet the following criteria:

(2) A sand and gravel removal operation shall not be located within the following distances of a bridge, pipeline, cable crossing, levee, or other feature, except when the

following criteria:

(2) A sand and gravel removal operation shall not be located within the following distances of a bridge, pipeline, cable crossing, levee, or other feature, except when the

written permission or easement of the owner of the bridge, pipeline, cable crossing, levee, or other feature is obtained by the applicant, and a written waiver is granted by the chief engineer:

(A) 50 feet of the banks, or in the channels of the Missouri, Kansas, or Arkansas rivers, and 50 feet of the banks, or in the channels of their tributaries, for ½ mile upstream from the mouth of the tributaries;

(B) one mile of a public water supply intake;

(C) 500 feet of a bridge;

(D) 300 feet of a buried pipeline or cable crossing; and

(E) 200 feet of a levee or other feature subject to damage.

(3) Stockpiles of material shall be located in a manner that does not affect the flow of water on the property of any other landowner.

Tom Schrempp, P.E.  
Director of Production  
WaterOne  
7601 Holliday Drive  
Kansas City, KS 66106  
W-913-895-5820  
M-913-461-5502



SERVICE. THE BARTLETT & WEST WAY.

December 9, 2011

Kale Horton  
U.S. Army Corps of Engineers  
635 Federal Building  
601 East 12<sup>th</sup> Street  
Kansas City, MO 64106-2896

RECEIVED  
REGULATORY BRANCH  
2011 DEC 15 AM 11:35

Re: Objection to Commercial Dredging Activities on the Kansas River  
Permit No. 2011-1462 (Holliday Sand & Gravel Company)

Dear Mr. Horton:

Thank you for the opportunity to comment on the reauthorization of Commercial Dredging Activities on the Kansas River. Bartlett & West, on behalf of the City of Bonner Springs, Kansas, herein formally submits a factual objection to the reauthorization of Commercial Dredging Activities on the Kansas River from reach RM 19.4 – 20.15 because the proposed activity may substantially impact the city’s water supply, creating an undue economic burden on the community.

The Bonner Springs water treatment plant (WTP) produces on average 1.15 million gallons per day from five wells, located on the left descending bank of the Kansas River between RM 19.4 – 20.15. See attached drawing for well locations. Although the facility’s source water is from the river’s alluvial aquifer, the WTP is not classified as “under the direct influence of surface water” (GWUI) by the Kansas Department of Health and Environment (KDHE). The process of collecting groundwater through the hydraulically connected alluvial sediments is known as riverbank filtration. Riverbank filtration removes particles, organic compounds, and pathogenic microorganisms from surface water (EPA 815-R-09-016, 2010); allowing utilities to indirectly take advantage of surface water resources without the high compliance costs associated with surface water treatment.

The production capacity and water quality enhancements provided by riverbank filtration rely on aspects such as riverbed hydraulic conductivity, channel morphology, and sediment transport (erosion or deposition). Major flooding, dam construction, and dredging operations all have acute and cumulative effects on the aspects that influence riverbank filtration effectiveness. Dredging operations can leave deep holes, can encourage bank erosion, and can cause bed degradation over time. In 1998 the Kansas Geological Survey determined the lower Kansas River is sensitive to degradation because incipient motion analysis of the bed load indicates that gravel sized material, the primary composition of the river’s stream-bed, cannot be transported by the river under the present hydrologic conditions, except during large floods. Therefore, dredged material could not be replenished readily. Moreover, this cumulative degradation of the lower Kansas River stream-bed has been documented by USACE surveys.

Because of the acute and cumulative impacts dredging has on riverbank filtration effectiveness, KDHE expressed at a meeting on Dec 6, 2011 to the City and Bartlett & West that if the proposed dredging operation occurs along the above-mentioned reach, then KDHE will evaluate the City’s WTP classification. This evaluation may or may not require microscopic particulate analysis (MPA). If the City’s WTP is

6919 VISTA DRIVE ■ WEST DES MOINES IA 50266-9309

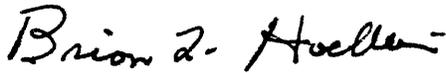
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reclassified as GWUI, the City will be required to construct a surface water treatment plant, establish a new drinking water source, or purchase water from another municipality. An engineering cost estimate procured by the city in 2008 indicated GWUI reclassification may cost the community as much as \$9.9 million (\$11 million in 2012 dollars).

Commercial dredging along Kansas River RM 19.4 – 20.15 jeopardizes the City of Bonner Springs WTP source water status, potentially reclassifying the source as GWUI. Reclassification of the source water will create a substantial financial burden on the community. Therefore, Bartlett & West on behalf of the City of Bonner Springs, KS objects to the reauthorization of Commercial Dredging Activities on the Kansas River from reach RM 19.4 – 20.15. For this reason, we request that the Corps of Engineers extend the expiration of the public notice to allow the Corps of Engineers to publish a comprehensive analysis of the data collected under the Kansas River Dredging Activities Monitoring Plan. This additional time will also allow the City of Bonner Springs, KDHE, the dredging applicant, and Bartlett & West to discuss the proposed dredging in the area of the city's wells to see if there might be a way to work out a plan that protects the city's wells, but still allows the commercial enterprise to move forward.

Sincerely,



Brian L. Hoellein P.E.

cc: City of Bonner Springs, Rick Sailer  
LBG, Martha Silks  
KDHE, Dan Clair  
KDA-DWR, Katie Tietsort

Enclosure: Map of Well Locations

**Bonner Springs Water Division  
Bonner Springs, KS**

WASTE WATER  
TREATMENT FACILITY

WATER TREATMENT  
PLANT & WELL #1

WELL #5

WELL #4

WELL #2

WELL #3

KANSAS RIVER

600 ft

© 2011 Google

39°03'47.47" N 94°51'59.74" W elev 783 ft

**BARTLETT & WEST**  
SERVING THE BARTLETT & WEST WAY.

Eye alt 4288 ft

Imagery Date: 6/5/2011

December 8, 2011



Kale E. Horton  
Regulatory Project Manager  
U.S. Army Corps of Engineers  
Kansas City Regulatory Office  
635 Federal Building  
601 East 12th Street  
Kansas City, Missouri 64106-2896

RECEIVED  
REGULATORY BRANCH  
2011 DEC 13 PM 2:28

**RE: Kansas River Dredging Application 2011-1465 (Master's Dredging)  
Potential Impact to City of Olathe Water Supply Facilities**

Dear Mr. Horton:

The City of Olathe (Olathe) understands that an application to dredge sand and gravel from the Kansas River (#2011-1465) has been submitted by Master's Dredging to the U.S. Army Corps of Engineers (Corps) for consideration. We are submitting comments on the proposed dredging stretches from River Mile 26.1 to 27.6 and River Mile 28.3 to 29.8, as those stretches are in very close proximity and adjacent to Olathe's public water supply wells.

While we recognize the importance of commercial sand and gravel dredging on the Kansas River, we are concerned that production of sand and gravel could compromise the production capability and water quality of Olathe's well field. Should dredging compromise the well field's production capacity or water quality, it could require substantial costs to compensate for the lost production, costs we do not believe the rate payers of Olathe should shoulder.

If the Corps decides to allow the in-stream dredging permits, Olathe requests that the Corps considers implementing regulatory and monitoring measures strict enough to ensure the integrity and long-term viability of the Olathe Public Water Supply is not compromised by in-stream dredging activities near and adjacent to Olathe's wells. We also request that the Corps work with the dredgers to accommodate their needs for sand and gravel by either dredging nearby stretches of water without critical public infrastructure or through the development of off-stream pits.

The enclosed attachment further details our areas of concern and requests regulatory plan restrictions and monitoring to protect Olathe's valuable water supply.

In conclusion, Olathe is not opposed to dredging in the Kansas River as long as these activities are regulated and monitored to ensure that the public water supply critical to citizens of Olathe is protected from reductions in supply capacity and negatively impacted water quality. We understand the dredging is not the sole source of river channel degradation. However, allowing

dredging this close to Olathe's wells has the potential to compromise the sole source of Olathe's public water supply. Olathe believes that the best alternative to protect Olathe's sole source of potable water is a no dredging buffer zone extending at least one mile upstream and one mile downstream of Olathe's well field.

Thank you for your consideration of our comments. Please contact me at (913) 971-9105 if you have any questions.

Sincerely,

A handwritten signature in black ink, appearing to read "Michelle Wirth". The signature is fluid and cursive, with the first name "Michelle" written in a larger, more prominent script than the last name "Wirth".

Michelle Wirth, P.E.  
Environmental Services Manager  
City of Olathe, Kansas

Cc: Katie Tietsort: Kansas Division of Water Resources  
Mike Tate: Kansas Dept. of Health & Environment  
Earl Lewis: Kansas Water Office  
Doug Brune: U.S. EPA, Region 7

## **BACKGROUND ON OLATHE PUBLIC WATER SUPPLY WELLS**

The City of Olathe's sole source of raw water supply to its 127,000 resident population with 34,400 customer accounts is a well field located adjacent to and beneath the Kansas River between River Mile 25.5 to 31.7. The well field consists of eight active vertical wells and four radial collector wells with a fifth future permitted collector well as noted on Figure 1. All of these wells are considered riverbank infiltration wells, deriving most of their production by inducing infiltration of river water through the river bed and into the underlying sand and gravel aquifer. Olathe has made considerable investment (approximately 95 million dollars in today's cost to replace) in the infrastructure to develop the water supply at this location.

Development of Olathe's well field began in 1964 with construction of the first four vertical wells. When these original wells were put in place, the groundwater table was approximately 21 feet below ground surface (759 feet msl elevation). This gave an aquifer saturated thickness of 35 to 45 feet, allowing for 15 to 25 feet of available drawdown above the 20-foot long well screens.

In 1981, the Olathe had finished installing all eleven vertical wells. By 1991, the groundwater table had declined seven feet (to approximately 752 feet msl elevation), which reduced vertical well capacities by 30 to 50 percent each (while maintaining pumping level above the top of the well screen). A corresponding decline in river surface elevation of eight feet at adjacent River Mile 27 has been documented in Corps surveys between Nov 1962 (1966 Lower Kansas River Basin Reservoir Regulatory Manual) and March 2002 for a flow rate of approximately 2,000 cubic feet per second (cfs).

By the 1990's it became apparent that with the decrease in aquifer saturated thickness, vertical wells were no longer providing adequate capacity per well, and Olathe switched to a different well design called a radial collector well. Radial collector wells use horizontal screens that can be placed much lower in the aquifer and extend beneath the river. Figure 2 shows a typical plan and section of a collector well. With the Olathe collector wells, the concrete caisson sits approximately 50 to 70 feet from the river's edge, while well screen laterals extend out horizontally (up to 225 feet) underneath the river bed at a depth of approximately 20 to 25 feet below the river bed (722 to 729 feet msl elevation). Collector wells have production capacities of 5 to 10 times that of the vertical wells, and are intended to have a lifespan of over 100 years (as opposed to 30 years for a vertical well); however, they also cost 20 times as much as a vertical well.

In 1998, Olathe installed its first horizontal collector well near River Mile 30. The fourth collector well was completed in 2006. In 2011, Olathe cleaned the intake laterals for Collector Well 1 and Collector Well 4 and plans to clean Collector Well 3 in 2012 at a total cost of approximately \$410,000 dollars. As no dredging has occurred since these wells were installed, these cleanings were due to normal operational requirements. Dredging may increase the cost and frequency of required cleanings.

**City of Olathe, Kansas**  
**Re: Kansas River Dredging Application 2011-1465**  
**Attachment**

Collector Well 5 is currently permitted by the Kansas Department of Agriculture, Division of Water Resources and listed in the Olathe's Capital Improvement Plan for construction beginning in 2017. Modeling has shown that the Olathe collector wells, on average, obtain 90 to 95 percent of their production from the river and that, as with other intakes, production capacity is tied to river surface elevation. It should also be noted that the Corps documented a five foot decline in river surface elevation at River Mile 30 between Nov 1962 and March 2002 for a flow of approximately 2,000 cfs.

Currently, Olathe helps protect flow and river surface elevation adjacent to the well field by purchasing reservoir storage from the Kansas River Water Assurance District. This ensures that during summer times of low flow, at least 750 cfs is flowing past the USGS gauging station at De Soto, Kansas.

**SPECIFIC CONCERNS RELATED TO APPROVAL OF DREDGING PERMITS**

Olathe is concerned that dredging activities in close proximity to Olathe wells could cause changes in river channel morphology and water quality that are potentially detrimental to the quantity and quality of Olathe's water supply. The requested permits would increase the current permitted annual tonnage to be removed between River Miles 21.2 to 48 from 750,000 tons to 1,350,000 tons. They would increase the current amount permitted in the 12 miles immediately downstream of the Olathe's well field from 600,000 tons to 1,200,000 tons.

**Potential Reduction in Well Capacity and Increase in Operating Costs**

Production capacity of riverbank infiltration wells such as Olathe's is highly dependent on the aquifer saturated thickness above the well screen, the ability of the river water to infiltrate through the river bed, the distance from the well to the river, and the river water temperature.

- **Reduction in River Surface Levels** – The Olathe well field's current capacity comes from the four collector wells and eight active vertical wells. The well field has a summer peak demand design capacity of 27 million gallons per day (MGD), and a summer combined specific capacity of 3.5 MGD per foot of drawdown. Dredging adjacent to and downstream of the well could potentially decrease river surface elevation (and aquifer saturated thickness) by a decreasing the river bed elevation and widening the river channel.

*Olathe is concerned that should the river surface be allowed to drop two feet adjacent to the Olathe wells, Olathe's water production capacity could drop as much as 7 MGD during summer peak demand (when it is most critical to citizens of Olathe). Cost to build additional infrastructure to replace lost capacity is estimated at approximately \$1 million per MGD based on cost estimates for Collector Well 5 construction. Lower water levels in the wells will also increase Olathe's electrical cost to operate the wells. Additional*

**City of Olathe, Kansas**  
**Re: Kansas River Dredging Application 2011-1465**  
**Attachment**

*operational costs due to a 2-foot decrease in water levels is estimated at \$2-3,000 per well per year.*

*Olathe has additional concern that localized stream bed degradation in the vicinity of the wells could exceed 2 feet if the removal of 600,000 tons of sand and gravel from a 3.7 mile stretch of river is allowed to occur. The current Regulatory Plan allows for degradation of an average of 2 feet per 5 miles of river reach but does not address the potential for greater levels of degradation locally that could impair critical infrastructure.*

- **Accelerated Clogging of Infiltration Zone by Silt Impingement** – Riverbank infiltration wells operate by inducing flow through the adjacent river bed and into the aquifer. When the wells are put online, well drawdown underneath the river increases flow velocity into the river bed, and suspended silt particles impinge into the pore spaces on the river bed surface, partially clogging the river bed. After a “seasoning” period, clogging of the river bed comes to equilibrium and there will be cycles of a larger area of clogging during low flows (and corresponding reduction in well capacity) and a scouring away of the clogged layer during high flows (and corresponding well capacity recovery).

*Olathe is concerned that an increased silt load in the river due to the dredge action and return flow of dredge water upstream of Olathe wells during lower river flow will increase the rate of clogging between scouring events. Olathe is also concerned that deepening/widening of the channel adjacent to wells could reduce the river’s velocity and could decrease its ability to scour away the silt clogging layer. This could detrimentally impact the well field by decreasing the wells’ production efficiency and increasing well operational and pumping costs. This is particularly critical during a low summer river flow and a high peak summer demand.*

- **Shifting of the Thalweg away from the Wells** – The riverbank infiltration wells produce best when constructed at a location where the river’s thalweg is close to the near bank, thus producing more scouring action over the infiltration area. This is especially critical during summer lower flow conditions when flow in the river (source of supply to the wells) is only in the deeper portions of the river channel. Distance to surface water is critical to well capacity. Currently, the river’s thalweg near the Olathe wells is somewhat stable due to manmade control structures immediately upstream of the De Soto bridge, the bluffs below the City of De Soto, riprap placed by Olathe, manmade control structures along the outside bend of the river from River Mile 27.6 to 28.3, and prohibited dredging due to river bed degradation.

*Olathe is concerned that dredging within the channel and progressive erosion of river bed upstream from dredged areas may shift the thalweg and deeper areas of the channel away from the Olathe wells; most particularly during critical periods of summer low flow in the river. Analytical models indicate that shifting the surface source of water 250 feet away from*

*collector wells can reduce production capacity by as much as 30 percent, and would require increased energy costs to operate pumps.*

### **Potential Damage to Physical Structures**

Olathe is concerned that allowing dredging in close proximity to the collector wells and to river control structures could be detrimental to these physical structures.

- **Collector Well Laterals** – Well laterals are set at a level below the river bed that can be reached by the dredge cutting heads. Laterals are composed of wire-wrapped continuous slot well screen and would be damaged by a dredge cutting head, should one operate near the screen.

*Olathe is concerned that damage to a lateral would cause a loss in production in the collector wells, damage equipment, and potentially render the lateral useless, thus significantly reducing well capacity.*

- **Well Caissons and Well Houses** – The well houses sit atop the well caissons are located as close as 50 feet from the river's edge, and are supported by piers not anchored in the underlying bedrock. While riprap has been placed to help stabilize the stream bank, the bank is composed of easily erodible sand.

*Olathe is concerned that riverbank erosion could potentially be caused by dredging downstream or adjacent to the collector wells, and could compromise the structural integrity of the well houses.*

- **River Control Structures** – River control structures such as the structures along the outside bend of the river between River Mile 27.6 to 28.3 could be compromised should dredging occur too close to the structures causing erosion beneath the structure, or should dredging cause changes in river morphology near those structures.

*Olathe is concerned that that if these structures are compromised, the river channel could potentially shift away from Collector Well 2 and the vertical well field and significantly reduce well field production capacity.*

### **Potential Changes in Olathe Raw Water Quality**

Olathe is concerned that disturbance of the river bed material, as well as of clay, silt, and organic material layers beneath the river bed upstream and adjacent to Olathe wells could potentially compromise the quality of the raw water supply and could require additional water treatment.

- **Total and Dissolved Organic Carbon** – Test hole drilling adjacent to the river bank indicates the presence of buried trees and highly organic clays and silts within the depth that would be dredged.

*Olathe is concerned that disturbance of buried organic matter and highly organic clays and silts will increase the organic carbon content in the river water and thus the total organic carbon content of the raw water supply. Organic carbon is a precursor for formation of disinfection byproducts which are regulated by EPA because they are carcinogenic. Treatment for additional organics in the raw water supply will, at a minimum, mean increased chemical costs for Olathe and may require additional unit processes at Olathe's water treatment facility to meet current regulations.*

- **Dissolved Iron & Manganese** – Naturally occurring iron and manganese is oxidized in streams and settles into the river bed sediment as an insoluble form that doesn't readily dissolve into surface water being produced by the wells. When the oxidized form is removed from the river and placed on the floodplain, particularly when in the presence of decaying organic material, the iron and manganese can be reduced to a soluble form. This soluble form readily infiltrates into the groundwater with precipitation, and can cause elevated dissolved iron and manganese levels in the raw water supply from the portion of production supplied by groundwater.

*Olathe is concerned that removal of silt and organic material from the dredged sand and gravel could potentially increase dissolved iron and manganese content in the raw water supply if not properly handled, stored, and disposed of. The method for addressing elevated iron and manganese at a water plant includes the use of a strong oxidant such as chlorine dioxide. Chlorine dioxide is costly and has considerable safety implications to operations due to its reactivity. Olathe currently does not need to feed chlorine dioxide.*

- **Other Chemicals** – The Corps 1990 EIS indicates the potential that toxic substances liberated during the dredging process could be in the dredging return water. Now-banned substances such as chlordane and PCB's could be adsorbed to the organic clays and silts within the sand and gravel being dredged. The aquifer between the river and the collector wells does an excellent job of removal constituents such as turbidity and organics but the dredging operation could potentially change the path of flow to the collector wells and reduce this treatment significantly.

*Olathe is concerned that harmful chemicals may be liberated from organic silts and clays during the dredging process and could potentially compromise the quality of the raw water supply and require additional water treatment. A change in the raw water supply may also reduce the capacity of the treatment plant as the plant is designed for its current influent water quality.*

## **REQUESTED CONDITIONS FOR KANSAS RIVER DREDGING PERMIT APPROVAL**

Olathe requests that the following regulatory and monitoring items be considered when processing Permit Application #2011-1465.

**City of Olathe, Kansas**  
**Re: Kansas River Dredging Application 2011-1465**  
**Attachment**

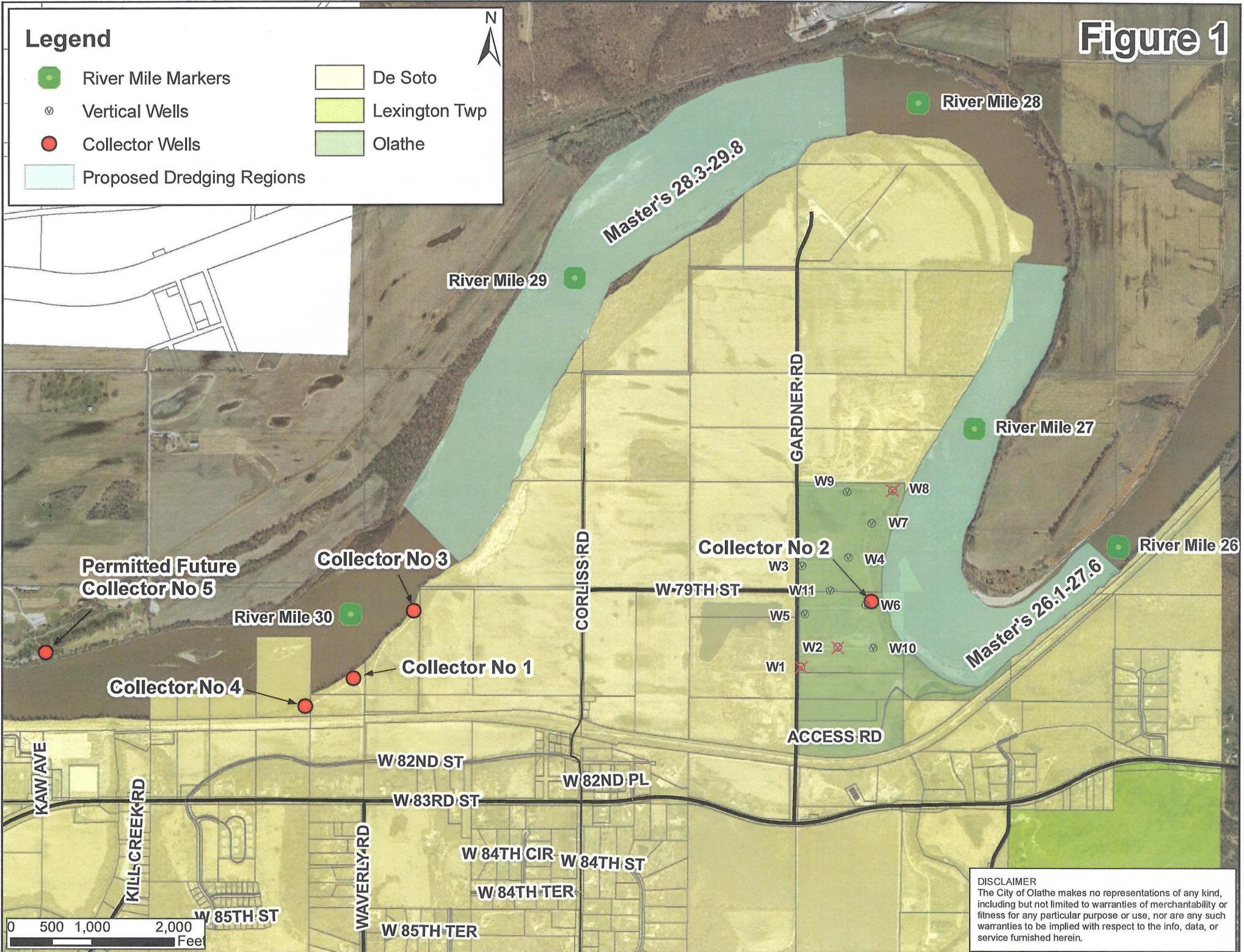
- **Buffer Zones** - Olathe requests that a no dredging zone for public water supply riverbank infiltration well fields extend from at least one mile upstream to one mile downstream of the Olathe wells between River Mile 25.5 to 31.7. Please refer to Figure 3. This request is based on the Kansas Administrative Regulation, K.A.R. 5-46-3, subsection c.2.B., which requires that sand and gravel removal operation not be located within one mile of a public water supply intake. The request is also based the Sunflower Army Ammunition Plant Intake buffer per the USACE Regulatory Plan for Commercial Dredging on the Kansas River. Olathe requests that the same considerations for a public water supply intake be applied to riverbank infiltration wells; as silt impingement and river degradation can reduce the ability to obtain water supply and thus capacity.
- **Dredged Return Water Processing** – Furthermore, if the Corps permits dredging between River Mile 27.9 to 28.8, then Olathe also requests the following:
  - Disposal of dredged return water back into the river only be allowed at a point at least 500 feet downstream of Olathe’s Vertical Well No. 10 to help minimize impacts to the segment of the Kansas River that contributes to Olathe’s raw water supply.
  - Disposal of water upstream of any Olathe well require a siltation basin and periodic monitoring for harmful chemicals.
  - Proper storage and disposal of removed silt and debris be required such that iron and manganese cannot migrate to groundwater that contributes to the wells.
- **Limits on Dredging During Periods of River Low Summer Flow** - Dredging upstream, adjacent to, and downstream of Olathe wells can potentially compromise Olathe’s public water supply. The greatest impact would occur during periods of summer low flow. This is when Olathe’s water supply needs are the greatest and the river has the lowest capacity to dilute harmful silt and chemicals within the river flow. Olathe requests that the Corps develop dredging restrictions based on flow readings at the USGS gauging station at the De Soto bridge to ensure that dredging is curtailed during low river flow.

**Stream Channel and River Surface Monitoring** - Olathe requests that USACE Regulatory Plan for Commercial Dredging on the Kansas River continue to be followed, that the degradation limits not exceed 2 feet on any 5 mile stretch, and that dredging be stopped on stretches that exceed degradation limits. Olathe requests that removal tonnage not be increased from previously allowed tonnages. Olathe requests monitoring of river bed cross-sections within active dredging zones and between dredging zones and wells be conducted on one year intervals during dredging and after cessation of dredging. Timely monitoring is essential to determine whether sustained dredging rates are impacting river surface elevations and thus well field production capacity. Olathe also requests that periodic inspection of river control structures be performed during active dredging and after cessation of dredging to determine if they have been compromised.

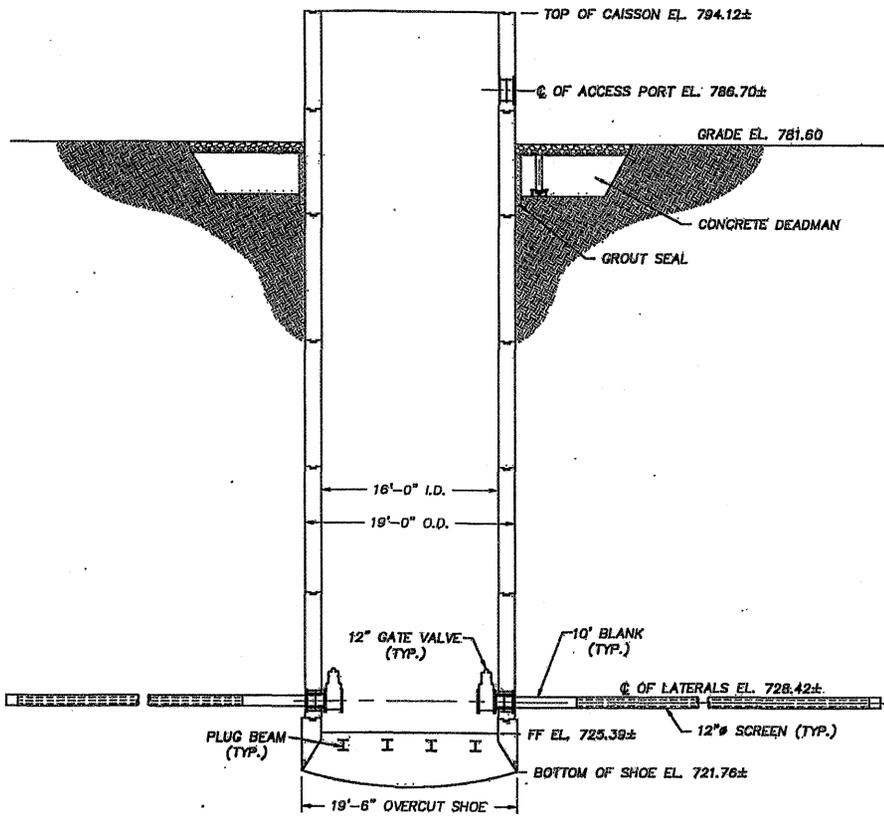
# Figure 1

## Legend

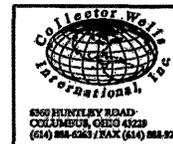
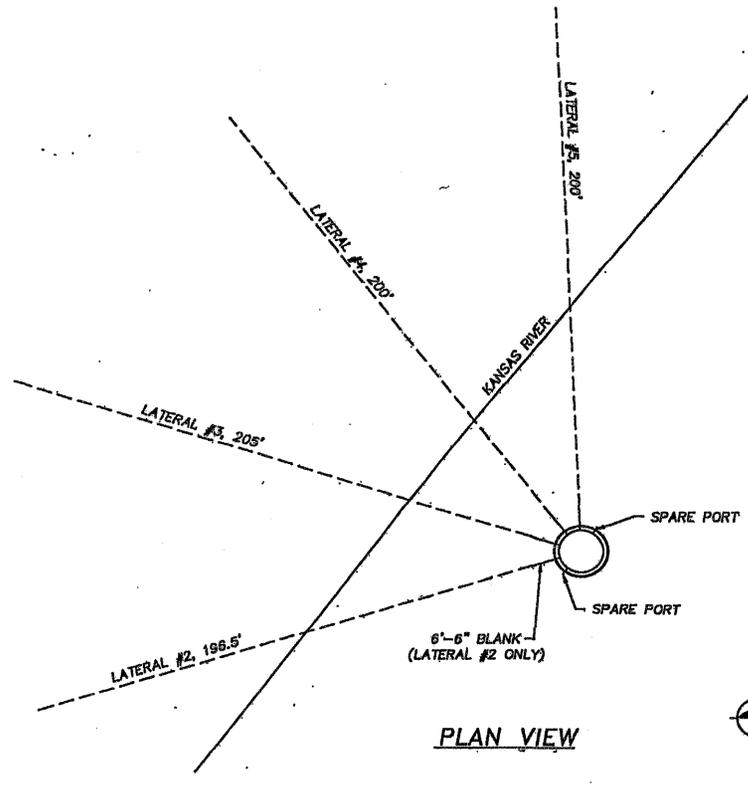
- River Mile Markers
- Vertical Wells
- Collector Wells
- Proposed Dredging Regions
- De Soto
- Lexington Twp
- Olathe



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VERTICAL SECTION THRU CAISSON



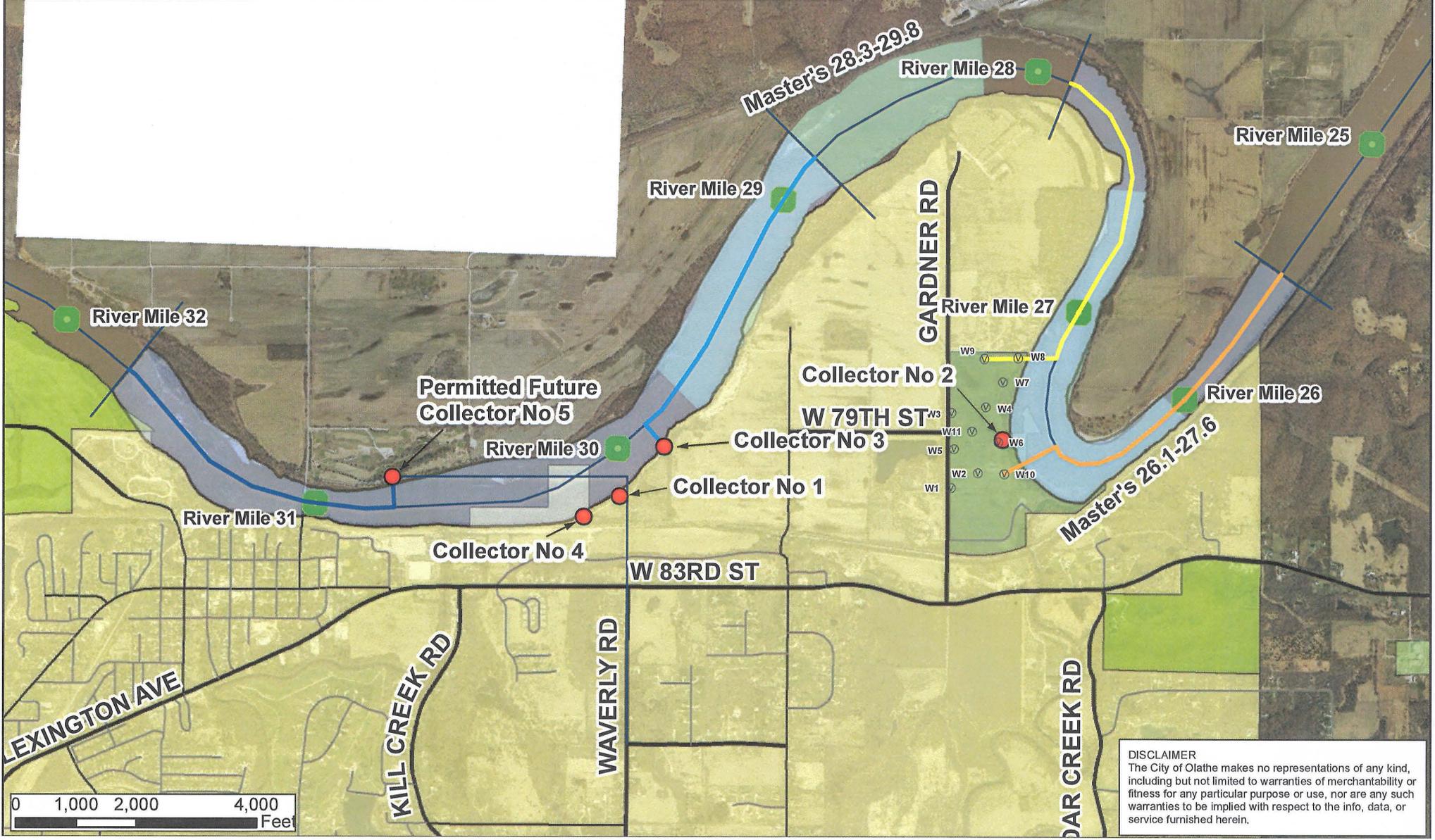
PLAN AND SECTION

FILE NAME:	DATE:	FIGURE
PROJECT #:	SCALE:	2

# Figure 3

## Legend

- |  |                           |  |                         |
|--|---------------------------|--|-------------------------|
|  | River Mile Markers        |  | De Soto                 |
|  | Vertical Wells            |   | CW3 Downstream- 1 Mile  |
|  | Collector Wells           |   | CW5 Upstream- 1 Mile    |
|  | Proposed One Mile Zone    |   | VW10 Downstream- 1 Mile |
|  | Proposed Dredging Regions |   | VW9 Upstream- 1 Mile    |
|  |                           |  | Lexington Twp           |
|  |                           |  | Olathe                  |



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