

ERRATA SHEET

March 2015

SUBJECT: Support Document for the Proposed Designation of the Mahomet Aquifer System as a Sole Source Aquifer, March 2014

This errata sheet corrects three typographical errors in the subject document. This errata sheet in combination with the subject document will represent the final Support Document for the Proposed Designation of the Mahomet Aquifer System as a Sole Source Aquifer.

Page 1, second full paragraph, second sentence. The following sentence will be deleted: “Once an SSA is designated, proposed projects receiving federal funds that fall within a specified area are reviewed by EPA to ensure that they will not endanger the SSA.” Not all federally funded projects are subject to EPA’s review under Section 1424(e) of the SDWA. EPA’s authority under Section 1424(e) of the SDWA is to review projects receiving “Federal financial assistance.” Projects receiving “Federal financial assistance” are a subset of those receiving federal funding. Therefore, this sentence will be replaced as follows (revisions in bold): “Once an SSA is designated, proposed projects receiving **Federal financial assistance** that fall within a specified area are reviewed by EPA to ensure that they will not endanger the SSA.”

Page 3, first full paragraph, fourth sentence. For the reasons explained above regarding the revision on Page 1, the following sentence will be deleted: “Finally, the project review area is the area for which EPA must review proposed federally funded projects if the proposed SSA is designated.” It will be replaced as follows (revisions in bold): “Finally, the project review area is the area for which EPA must review proposed **projects receiving Federal financial assistance** if the proposed SSA is designated.”

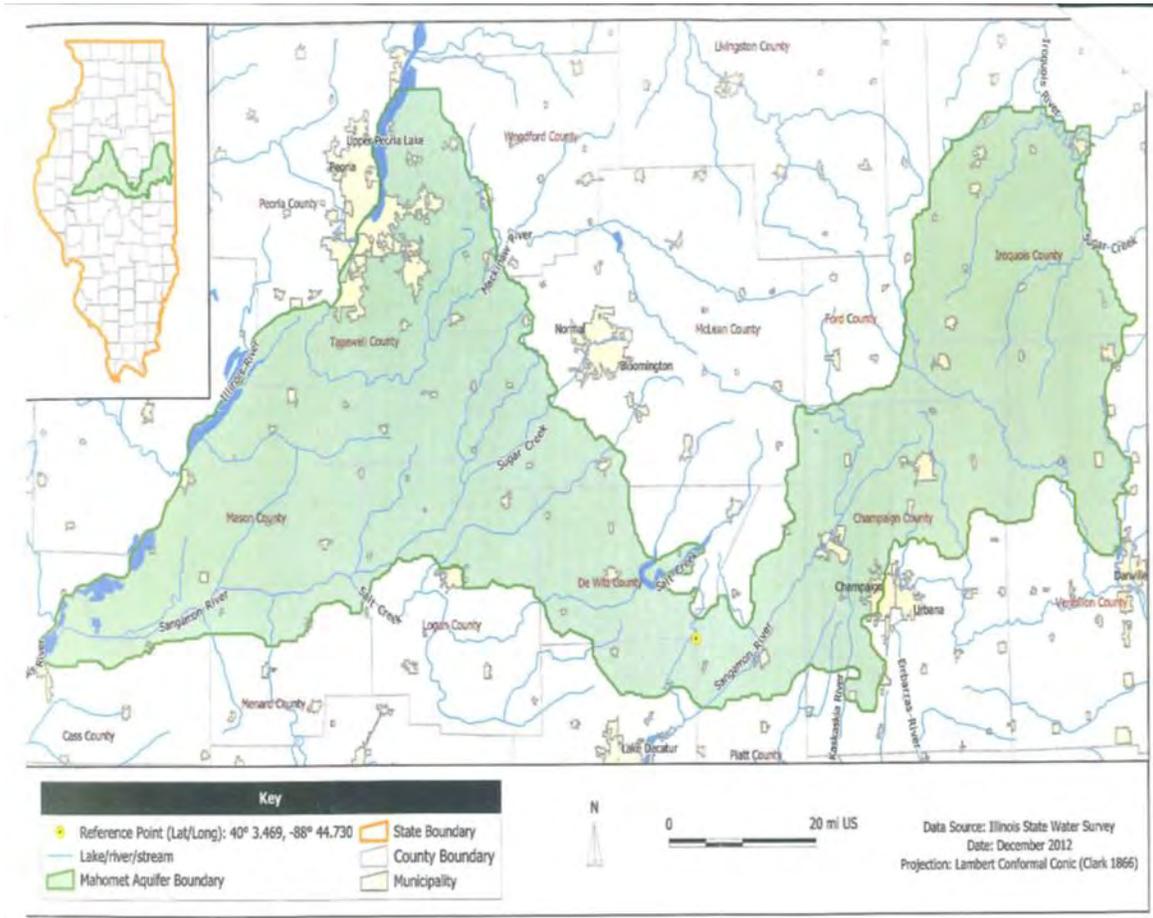
Page 5, first full paragraph, seventh sentence. The reference to “parts of Salt Creek” was made in error. The correct reference is as follows (revisions in bold): “Based on its review of available information, EPA believes that there is evidence showing the streamflow source areas that recharge the Mahomet Aquifer include tributaries and upstream portions of the Sangamon River in McLean County, Ford County and Champaign County; Sugar Creek; and **tributary to the Middle Fork of the Vermilion River in Ford County and Livingston County.**” This change does not alter the proposed (and now the final) SSA area or project review area.

Page 9, heading. The heading entitled “Economic Feasibility of Obtaining Drinking Water from Nearby Sand and Gravel Aquifers and Free-Flowing Rivers and Streams” was incorrectly numbered. It will be replaced with the number “**3.**”

Page 10, third full paragraph, fourth sentence. The following sentence will be deleted: “Based on this analysis, EPA believes that less than 50% of the population in the

Mahomet Aquifer service area would be able to find a feasible alternate source of water should the proposed SSA become contaminated.” It will be replaced as follows: “Based on this analysis, EPA believes that less than 50% of the population in the Mahomet Aquifer service area would be able to find **an economically** feasible alternate source of water should the proposed SSA become contaminated.”

SUPPORT DOCUMENT FOR PROPOSED DESIGNATION OF THE MAHOMET AQUIFER SYSTEM AS A SOLE SOURCE AQUIFER



SUPPORT DOCUMENT FOR PROPOSED DESIGNATION OF THE MAHOMET AQUIFER SYSTEM AS A SOLE SOURCE AQUIFER

A coalition of cities, a town, villages, and a public university in east-central Illinois has petitioned Region 5 of the U.S. Environmental Protection Agency (EPA) to designate a portion of the Mahomet Aquifer system as a “sole or principal drinking water source” pursuant to Section 1424(e) of the Safe Drinking Water Act (SDWA), 42 U.S.C. § 300h-3(e).¹ After review of the petition and supporting information submitted by the coalition, EPA proposes to recommend that the Regional Administrator designate the petitioned aquifer system as sole or principal source. This document provides background on the Sole Source Aquifer Program and describes how the proposed portion of this aquifer system likely meets the criteria for designation. EPA invites public comment on the petition and its analysis in this document. EPA plans to finalize its recommendation to approve or deny the petition after an opportunity for and consideration of any public comments.

I. Sole Source Aquifer Program Background

Section 1424(e) of SDWA authorizes EPA to designate an aquifer as a sole source aquifer (SSA) if it is the sole or principal source of drinking water for the area and contamination of the aquifer would create a significant hazard to public health. Once an SSA is designated, proposed projects receiving federal funds that fall within a specified area are reviewed by EPA to ensure that they will not endanger the SSA. The designation of an SSA provides limited federal protection of the ground water resource and should not be used as the sole or determining factor in making land use decisions. Effective protection of drinking water sources requires comprehensive efforts on the federal, state, and local levels.

EPA has published the Petitioner’s Guidance for Sole Source Aquifer Designation (Guidance), which is available at <http://www.epa.gov/region02/water/aquifer/petition/>. The Guidance outlines the petition process and lists criteria for SSA designation. In the Guidance, EPA defines a “sole or principal source” as an aquifer that is needed to supply 50% or more of the drinking water for the population above the aquifer and for which there are no economically feasible alternative drinking water sources should the aquifer become contaminated. A portion of an aquifer may be designated as an SSA if it is hydrogeologically separate from the rest of the aquifer. Similarly, a system of hydrogeologically connected aquifers can also be designated as an SSA.

The Guidance explains EPA’s two-staged review process. First, EPA reviews the petition to determine if it is complete. If it is not, EPA may request additional information. Second, EPA conducts a technical review to: 1) verify the boundaries of the aquifer and the area above the aquifer, including the area where the entire population

¹ The coalition is comprised of the Cities of Champaign, Urbana, Delavan, and Gilman; the Town of Normal; the Villages of Savoy, Mansfield, and Mahomet; and the University of Illinois at Urbana-Champaign. The City of Eureka and Village of DeWitt, while not part of the coalition, have expressed their support for the petition.

served by the aquifer lives (aquifer service area), 2) verify that the aquifer is the sole or principal source of drinking water for the aquifer service area, 3) verify or modify, as appropriate, the boundaries of the designated area and the area within which proposed projects receiving federal financial assistance will be reviewed (project review area), 4) provide opportunity for and consider public comments, and 5) make a recommendation to the Regional Administrator regarding designation of the aquifer or aquifer system as an SSA.

II. The Mahomet Aquifer SSA Petition

On December 12, 2012, EPA received the coalition's petition to designate a portion of the Mahomet Aquifer as sole source aquifer. The portion of the Mahomet Aquifer proposed for designation extends beneath portions of 14 counties in east-central Illinois from the Vermillion River in the east to the Illinois River on the west. According to the coalition, water may move through overlying aquifers into the Mahomet Aquifer, and thus, the coalition asks EPA to designate the Mahomet Aquifer and the overlying aquifers as an aquifer system. The petition proposes that the sole source aquifer boundary should generally follow the 500-foot Mahomet Aquifer buried valley contour line in Illinois. The proposed sole source aquifer boundary is limited to the aquifer boundary itself and does not include upstream watersheds.

The coalition's stated purpose for pursuing sole source aquifer designation is to call attention to the Mahomet Aquifer's importance as a drinking water source and critical economic resource, its vulnerability to contamination, and its high water quality. More specifically, the coalition states that the petitioned aquifer is a source of high-quality, inexpensive drinking water for overlying and nearby communities and users. According to the petition, approximately 54 million gallons of drinking water are pumped from the Mahomet Aquifer each day and even more water is pumped from the aquifer to irrigate crops during the growing season. The coalition maintains that there are complex pathways between the surface and overlying aquifers to principal aquifer in the eastern portion and that there is no confining layer between the surface and the principal aquifer in the western portion, making the petitioned aquifer vulnerable to contamination.

As set forth in the Guidance, EPA performed an initial review of the petition and requested further information from the coalition concerning the aquifer service area, alternative sources of drinking water, and hydrogeological information. EPA now believes the petition is complete and has conducted its technical review of the petition, the additional information submitted by the coalition, and the information referenced in the coalition's materials. As explained in more detail below, EPA has verified the economic, demographic, and geologic data submitted by the coalition.

III. Technical Review

A. Proposed Boundaries

In order to designate an SSA, three boundaries must be delineated: (1) the proposed SSA area, (2) the aquifer service area, and (3) the project review area. The proposed SSA area is the physical area in which the designated aquifer is located. The aquifer service area is the area where the entire population served by the aquifer lives and can include areas that rely on the aquifer for water but are outside the proposed SSA area. Finally, the project review area is the area for which EPA must review proposed federally funded projects if the proposed SSA is designated. The project review area can include upstream watersheds or similar areas beyond the SSA boundaries if such upstream watersheds or areas contribute to the recharge of the proposed SSA.

EPA has reviewed the boundaries proposed by the coalition, as well as information supporting the selection of those boundaries. Based on the information provided, EPA believes that the boundaries proposed by the coalition for the SSA area and aquifer service area fit within the designation criteria. After reviewing available information regarding upstream watersheds that contribute to recharge within the proposed SSA area, however, EPA is proposing a larger project review area than that proposed by the coalition.

1. Proposed SSA Area

The coalition's proposed SSA boundary, illustrated in Figure 1, generally follows the 500-foot Mahomet Aquifer buried valley contour line in Illinois, which has been identified as the outer edge of the principal Mahomet Aquifer. The Mahomet Aquifer extends into Indiana in the east and past the Illinois River in the west. The coalition, however, proposes to designate only a portion of the aquifer, bounded by the Iroquois River and the North Fork of the Vermillion River in the east and the Illinois River in the west. The coalition has stated that the portion of the Mahomet Aquifer system proposed for designation is hydrogeologically and hydraulically separate from the remainder of the aquifer. Citing a 2011 study of the Mahomet Aquifer, the coalition stated that groundwater east of the proposed boundary discharges to the Iroquois River to the northeast and the North Fork of the Vermillion River to the east and southeast. Based on that information, groundwater in the aquifer to the east of those rivers does not move westward into the portion of the aquifer proposed for designation. In addition to reviewing the information provided by the coalition, EPA has discussed the proposed eastern boundary with Indiana Department of Environmental Management and Indiana Department of Natural Resources, both of which concur that the proposed eastern boundary is a plausible hydrogeological separation in the aquifer system. The coalition also states that groundwater west of the Illinois River discharges into the Illinois River, thereby creating a hydrogeologic and hydraulic separation. Based on EPA's review of the petition and other available information, EPA believes the coalition's proposed SSA area is justified.

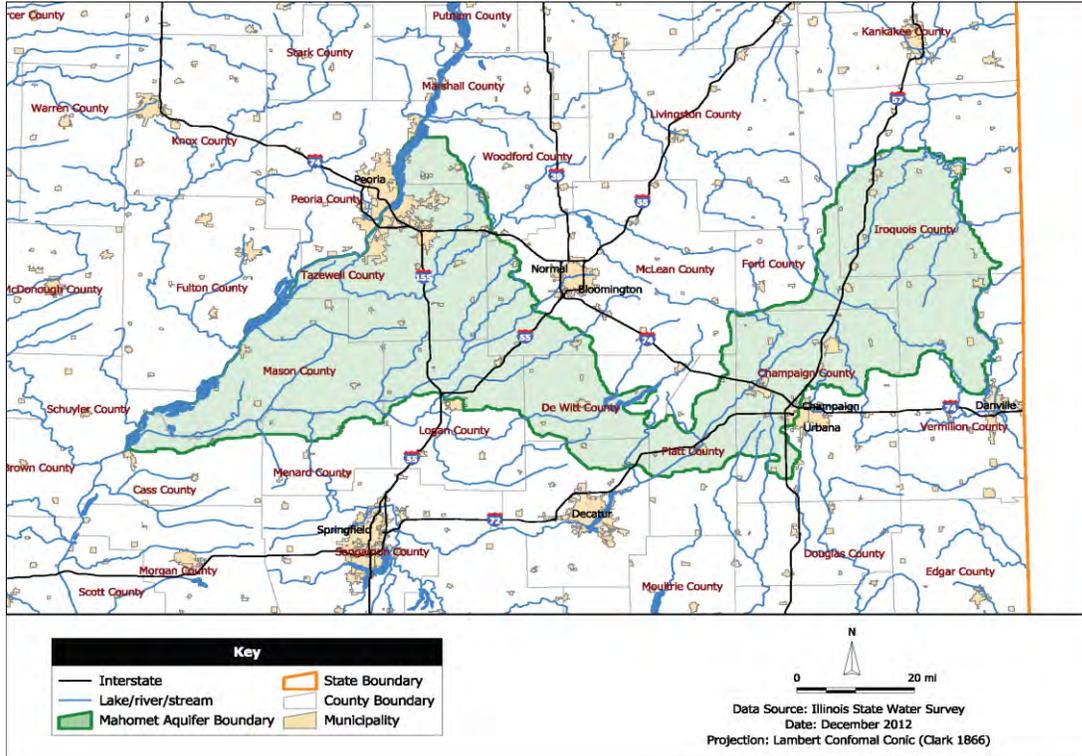


Figure 1: Boundaries of the Proposed SSA

The proposed SSA area includes not only the principal Mahomet Aquifer, but also the shallower aquifers and other geologic units above this portion of the principal aquifer. EPA has reviewed scientific evidence that demonstrates the shallower aquifers and the principal aquifer are connected in the western portion of the proposed SSA area. While much of the eastern portion of the proposed SSA area is confined by low-permeability glacial till, studies support the existence of some interconnections between the overlying geologic units and the Mahomet Aquifer in this area. Consequently, EPA proposes to designate the entire aquifer system within the proposed SSA area.

2. *Proposed Aquifer Service Area*

The proposed aquifer service area is illustrated in Figure 2. The proposed aquifer service area is largely the same as the SSA area, but it also includes several communities that are outside the proposed SSA boundary but withdraw water from the Mahomet Aquifer. These communities are predominantly in southern Champaign County as well as in Douglas, Coles, and Cumberland Counties. In addition, the proposed service area includes the communities of Cerro Gordo (Piatt County), Petersburg (Menard County), Virginia (Cass County), and Normal (McLean County).

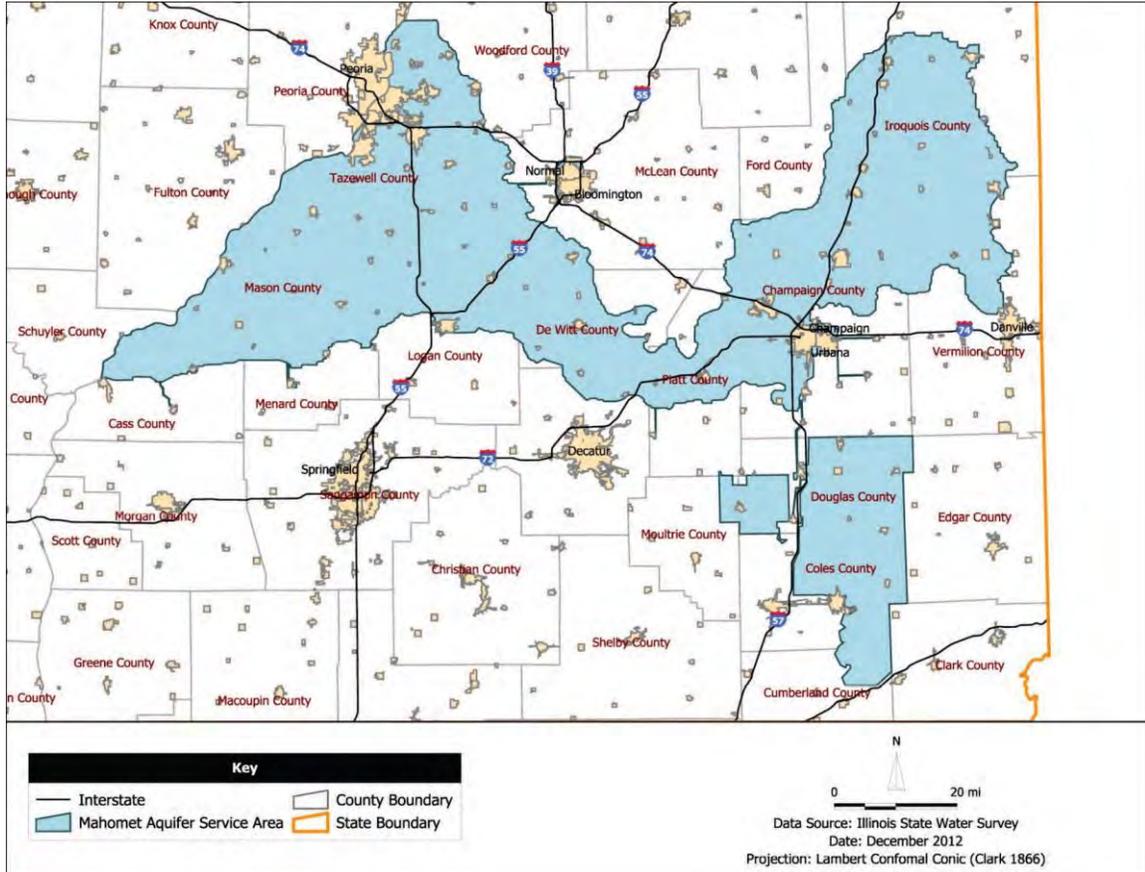


Figure 2: Proposed Mahomet SSA Service Area

3. *Proposed Project Review Area*

The proposed project review area is the area within which federal financially-assisted projects would be reviewed if the proposed SSA were designated. This area is shown in Figure 3. The Guidance provides that the project review area should include streamflow source areas that contribute to recharge of the proposed SSA. Streamflow source areas are defined as upstream headwater areas of losing streams that flow into aquifer recharge areas. The petition identifies certain areas within the proposed SSA area that are recharged by losing streams with headwaters outside of the proposed SSA boundary. Although the coalition has proposed that the project review area be the same as the SSA area, EPA believes that the watersheds of these streamflow source areas should be included in the proposed project review area. Based on its review of available information, EPA believes that there is evidence showing the streamflow source areas that recharge the Mahomet Aquifer include tributaries and upstream portions of the Sangamon River in McLean County, Ford County and Champaign County; Sugar Creek; and parts of Salt Creek.

Proposed Mahomet SSA Boundaries

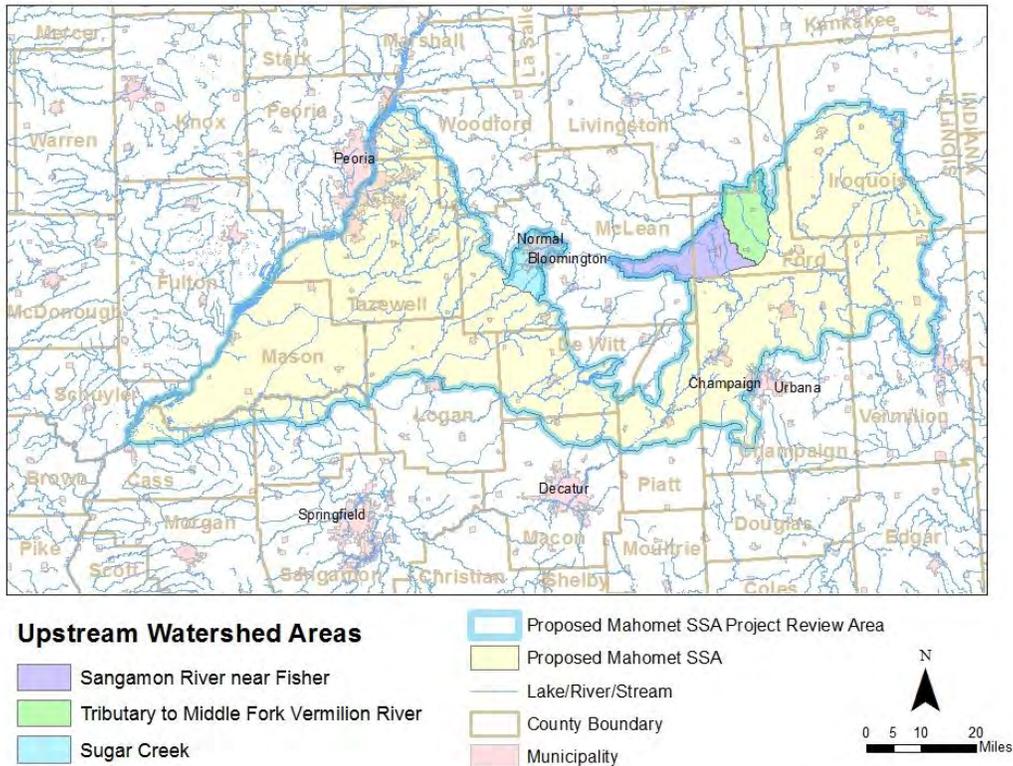


Figure 3: Proposed Project Review Area

B. Sole or Principal Drinking Water Source Analysis

To be considered a sole or principal source, the aquifer must be needed to supply 50% or more of the drinking water for the aquifer service area, and the volume of drinking water that could be supplied by alternative sources must be insufficient to replace the petitioned aquifer if it became contaminated. An alternative source of drinking water is any surface or ground water near the service area that is currently used, or has the potential to be used, as a drinking water supply. The Guidance includes a step-by-step process used to determine whether the petitioned aquifer is the sole or principal source of drinking water for the aquifer service area.

EPA has reviewed the petition and the information supporting the coalition’s sole or principal source analysis. Based on the information provided by the coalition, EPA believes that the Mahomet Aquifer is needed to supply more than 50% of the drinking water for the aquifer service area and the other drinking water sources currently used by those within the service area are insufficient to replace the Mahomet Aquifer. In addition, EPA believes the data and information submitted by the coalition show that potential alternative sources of drinking water either have insufficient capacity to replace

the Mahomet Aquifer, or according to the criteria set forth in the Guidance, it would be economically infeasible for potential alternative sources to deliver drinking water of the same or better quality as compared with the Mahomet Aquifer.

1. Current Sources of Drinking Water for the Service Area

According to the coalition, there are no intakes from surface waters for public water supplies within the proposed aquifer service area. The only other currently used sources of drinking water are shallow, local aquifers that lie outside the proposed SSA boundary, but are used by cities and towns within the aquifer service area boundary. These aquifers provide 3,440,000 gallons per day (gpd) of drinking water to public water supply users. By comparison, the Mahomet Aquifer currently supplies approximately 53,150,000 gallons per day (gpd) of drinking water to public water supplies and an estimated 4,310,000 gpd to private, domestic water well users.

After receiving the petition, EPA asked the coalition to produce additional background source data and explain the calculations it used to determine available drinking water supplied by the Mahomet Aquifer. EPA also cross-referenced system locational data with that in the petition to verify that all towns located within the proposed SSA area were included in the coalition's analysis. Based on its review, EPA believes that the coalition calculation of the average daily volume of drinking water supplied by the Mahomet Aquifer system to the proposed service area is reasonable.

2. Potential Alternative Drinking Water Sources

The Guidance provides that the coalition must also demonstrate that potential alternative sources of drinking water near the proposed aquifer service area have insufficient capacity, or if the sources have sufficient estimated capacity, that it would be economically infeasible for the potential alternative sources to deliver water of the same or better quality than that provided by the Mahomet Aquifer. A potential alternative source is "near" the proposed aquifer service area if it is within the distance that is considered normal for the local area. For purposes of its petition, the coalition considered a potential alternative source to be "near" if it is within ten miles of the proposed SSA area. EPA requested and obtained the supporting data and calculations used by the coalition to establish its "near" criterion. EPA then compared the data presented with well and water treatment plant location data in its own database. Based on its review and analysis, EPA concurs with the coalition's use of a 10-mile distance for determining whether a potential source is "near."

The coalition identified four potential alternative sources of drinking water near the proposed aquifer service area: (1) sand and gravel aquifers; (2) bedrock aquifers; (3) reservoirs; and (4) free-flowing streams and rivers. All of these potential alternative sources have limitations according to information provided by the coalition. Due to low potential yields and poor water quality, bedrock aquifers are not considered a viable alternative drinking water source. While there are four water supply reservoirs overlying or near the petitioned Mahomet Aquifer, a 2011 study relied upon by the coalition

determined that these reservoirs lack additional capacity to serve as an alternative water supply in the future. Estimated increases in the water supply demands and lower yields resulting from any future droughts suggest that these reservoirs cannot serve as alternative sources of drinking water for the aquifer service area. EPA performed a literature search to find studies which might contradict this information, but found none. Therefore, EPA concurs with the coalition's conclusion that sand and gravel aquifers and free-flowing streams and rivers are the only potential alternative sources of drinking water for communities within the proposed SSA area.

Areas outside the Mahomet Aquifer boundary have access to shallow, local groundwater sources. Wells drawing water from the alternative sand and gravel aquifers typically produce less than 100 gallons per minute. According to information submitted by the coalition, the alternative sand and gravel aquifers are also limited in size and sensitive to drought. Thus, while they may have sufficient estimated daily supply to be considered an alternative source of drinking water, the sand and gravel aquifers likely do not have sufficient capacity to satisfy the water demands of larger communities within or near the proposed SSA boundary. Two examples of such communities are Champaign/Urbana, which currently demands approximately 22 million gpd, and Normal, which currently demands more than 4 million gpd.

One hundred fifteen of the approximately 120 community water supplies within or near the proposed aquifer service area have access to sufficient free-flowing streams and rivers to satisfy their 2010 water usage rates. Several major river systems are located within or near the proposed aquifer service area, including the Embarras River, Illinois River, Iroquois River, Kaskaskia River, Mackinaw River, Sangamon River, and Vermillion River. The lower Sangamon River and the Illinois River are considered public waters in Illinois, and therefore, a withdrawal is prohibited if it will cause flow to be reduced below the seven-day, ten-year low flow average.

Based on state-wide aquifer yield estimates for the sand and gravel aquifers and flow data for the major river systems, the coalition calculated estimated daily supplies for these alternative sources. More specifically, the coalition calculated the estimated daily supply of the sand and gravel aquifers by using geographical information system technology to define a 10-mile buffer zone around the perimeter of the proposed SSA boundary and a map of potential aquifer yields. As for the estimated daily supplies of the major river systems within or near the proposed SSA boundary, the coalition used maps generated by the Illinois State Water Survey (ISWS), which depicted seven-day, ten-year low flow rates and information on the 2010 pumping rates for each town located within the proposed aquifer service area. If the seven-day, ten-year low flow rates were greater than the 2010 pumping rates for all towns located within 10 miles of the nearest point with sufficient flow, the coalition used the specific town's 2010 pumping rate to calculate estimated supply.

The total available potential alternative supply for the sand and gravel aquifers and free-flowing streams and rivers was calculated as 2,841,076,487 gpd. Table 1 is a reproduction of the coalition's table listing alternative sources and their estimated daily supply. The Illinois River contains the majority of the available alternative water for use.

Drinking Water Sources	Estimated Daily Supply (gpd)	Percent
Petitioned aquifer supply	600,000,000	--
Sand-and-gravel aquifers (10 mile buffer around service area)	458,300,000	16.1
Illinois River near Beardstown	2,355,825,073	82.9
Salt Fork near Danville (this is the flow that is in the Vermilion River below Danville)	20,294,350	0.7
Embarras River near Greenup	3,360,848	0.1
Kaskaskia River near Atwood	3,296,216	0.1
Total potential supply	2,841,076,487	100

Table 1: Potential Alternative Drinking Water Sources

According to information submitted by the coalition, the Mahomet Aquifer can theoretically supply approximately 600,000,000 gpd, which exceeds the current drinking water use estimate of 57,640,000 gpd. Nonetheless, because the total potential supply of the sand and gravel aquifers and free-flowing streams and rivers within or near the proposed aquifer service area exceeds both the current drinking water use estimate and theoretical supply of the Mahomet Aquifer, the coalition considered whether developing these potential alternative sources of drinking water was economically feasible.

2. *Economic Feasibility of Obtaining Drinking Water from Nearby Sand and Gravel Aquifers and Free-Flowing Rivers and Streams*

Because the sand and gravel aquifers and the major river systems theoretically have sufficient capacity to replace the Mahomet Aquifer, the coalition conducted an economic analysis to determine whether developing these potential alternative sources would impose an unusual economic burden to the communities and individuals that currently use the petitioned Mahomet Aquifer system. The coalition selected the Guidance's more quantitative method for evaluating the economic feasibility of replacing the proposed SSA with nearby surface water and groundwater sources. The coalition calculated the estimated costs to develop, design, build, and operate community water supplies using potentially available surface water and using potentially available groundwater. For private water users, the coalition assumed that the costs of developing surface water sources would be economically infeasible due in large part to the fact that individual users could not afford the associated costs. In addition, the coalition did not

calculate the economic feasibility of developing groundwater for private water use within the 10-mile area beyond the boundary of the Mahomet Aquifer, because it assumed that any such private water users would be too far away from the potential source. At this time, EPA has no reason to refute these assumptions.

After calculating the annual cost per household for the two available replacement sources, the coalition compared these costs to the median household income (MHI) for a particular town or city. As directed by EPA's Guidance, the coalition applied a three-tiered classification system to determine whether potential replacement sources were economically feasible. If the annual cost per household was greater than 0.6% of the MHI for a particular town or city, the source was deemed economically infeasible. If the annual cost per household was greater than 0.4% but less than 0.6% of the MHI for a particular town or city, the source was classified as economically possible. If the annual cost per household was less than 0.4% of the MHI for a particular town or city, the source was classified as economically feasible. EPA reviewed and verified the information submitted by and referred to in the coalition's economic analysis. The MHI figures used in the petition correspond with those published in the 2010 U.S. Census and the population served information corresponds with that in Illinois EPA Source Water Fact Sheets.

The petition concluded that out of 111 community water suppliers that had an available alternative source of surface water, 102 were classified as economically infeasible, 7 were economically possible, and 2 were economically feasible. For the 120 community water suppliers that had an available alternative source of ground water, 92 were classified as economically infeasible, 14 were economically possible, and 14 were economically feasible. At EPA's request, the coalition analyzed the economic feasibility of two regional water systems as a means of providing alternative surface water supplies in the western portion of the aquifer. Neither regionalization scenario is considered economically feasible.

According to EPA's Guidance, the total estimated daily supply of all economically feasible potential alternative sources should be tallied and compared with the total estimated daily supply of the petitioned aquifer. If the total estimated daily supply of the petitioned aquifer is greater than the total estimated daily supply of all economically feasible potential alternative sources, the Guidance assumes that the petitioned aquifer cannot be replaced by economically feasible alternative sources. EPA verified the coalition's analysis by totaling the most current pumpage rates for all the systems within the proposed Mahomet Aquifer service area and then compared this number with the amount of feasibly available water. Based on this analysis, EPA believes that less than 50% of the population in the Mahomet Aquifer service area would be able to find a feasible alternate source of water should the proposed SSA become contaminated.

IV. Conclusions and Recommendations

Based on a review of the petition and supporting information, EPA preliminarily believes that the petition meets the criteria for sole source aquifer designation as set forth by Section 1424(e) of SDWA, 42 U.S.C. § 300h-3(e), and EPA's Guidance. EPA invites the public to submit comments on the proposed recommendation to designate this portion of the Mahomet Aquifer system as a sole source aquifer during the public comment period. The petition and any addenda are available for public review and copying at the following locations: U.S. EPA, Region 5, 77 W. Jackson Blvd., Chicago, Illinois 60604; Champaign Public Library, 200 W. Green St., Champaign, Illinois 61820; Bloomington Public Library, 205 E. Olive St., Bloomington, Illinois 61701; Pekin Public Library, 301 S. Fourth St., Pekin, Illinois 61554; Havana Public Library, 201 W. Adams St., Havana, Illinois 62644; and Watseka Public Library, 201 S. 4th St., Watseka, Illinois 60970.

After consideration of all comments and information submitted during the public comment period, EPA will submit a final recommendation to the Regional Administrator to approve or deny the petition.