

Responses Regarding Water Supply

Comment WS1

Document the public participation process conducted for the proposed water supply service area plan. Also, you'll need to provide evidence that the governing bodies of the towns of Waukesha, Genesee, and any other city, village or town addressed by the plan have approved the Water Supply Service Area Plan prior to re-submittal.

Response

The City of Waukesha conducted several public meetings that included discussion of the future water supply and planning area issues. During these meetings, the public had the opportunities to ask questions and make comments. Attachment WS1 contains a list of the meetings that took place between 2006 and 2011. The topics discussed generally included the following:

- Long-term water supply planning
- Population projections and water demand forecast
- Declining groundwater supply sources
- Sustainable water resources management
- Application for Great Lakes Water and return water alternatives
- Developing additional shallow aquifer wells
- Water conservation planning
- Legal issues associated with water supplies located outside the City's jurisdiction)

The Town of Genesee and the Town of Waukesha were represented in the Southeastern Wisconsin Regional Planning Commission (SEWRCP) regional water supply planning study (final, 2010). The Town of Genesee and the Town of Waukesha were also involved in the *Waukesha County Comprehensive Plan* (2009). Thus, the towns were party to the planning information including the delineated water service area. In accordance with proposed draft NR 854.09, the City formally requested the towns review and approval of the City of Waukesha water supply service area plan accepted by regional and county planning authorities. The Town of Genesee approved the water supply service area plan March 14, 2011. The Town of Waukesha approval of the water supply service area plan is pending. To assist the Town of Genesee and the Town of Waukesha in their community meetings on this subject, the City of Waukesha provided maps and other technical information, as requested. Attachment WS1 contains related correspondence, meeting agenda, and meeting minutes.

Comment WS2

Provide an analysis of how the water supply service area plan is consistent with any approved comprehensive plans. Document how the plan is consistent with key elements of comprehensive planning, including: utilities and community facilities; housing; land use; natural resources; economic development; and implementation.

Response

Both the *City of Waukesha Comprehensive Plan* (2009) and the *Waukesha County Comprehensive Plan* (2009) align strongly with planning work conducted by SEWRPC. Consequently, with respect to water supply service area planning there is consistency in regional, county, and city plans. The City's water supply service area plan is consistent with the regional land use plan which delineates residential housing, commercial and industrial areas, and environmental corridors to be preserved. The City's water supply service area is consistent with the detailed *Planning Report on Regional Water Supply for Southeastern Wisconsin* (SEWRPC 2010).

Implementation of the City's water supply service area plan, particularly with respect to providing water service to customers outside the City's jurisdiction, is consistent with SEWRPC plans. In its regional planning capacity, SEWRPC has determined that the City should be prepared to provide water service to delineated areas outside of City jurisdiction, if requested by the residents of those areas. Those areas, in the towns of Genesee and Waukesha, are served by private wells that sometimes are contaminated by private septic systems. Like regional planning commissions across the state, SEWRPC establishes contingency plans to provide water and wastewater service to its regional communities.

Comment WS3

The water supply service area plan should describe how the water supply service area plan is consistent with any approved applicable area wide water quality management plan under s. 283.83, Wis. Stats., and ch. NR 121, Wis. Admin. Code. Specifically, describe how the water supply service area plan is consistent with the goals and objectives of the sewer service area plan and area wide water quality management plan; describe how the water supply service area plan is consistent with any specific plan recommendations in the sewer service area plan or water quality management plan including issues related to wastewater infrastructure and effluent.

Response

SEWRPC delineated both the City's water supply service area plan and sewer service area plan. There are negligible inconsistencies (in terms of water and wastewater flows) between the two service areas. These are described in Appendix E (Waukesha Wastewater Facility Plan Amendment: Return Flow) of the Application for Lake Michigan Water Supply. There are no inconsistencies between the information documented in the *Sanitary Sewer Master Plan for the City of Waukesha, Wisconsin* (Donohue & Associates 2010), and the water supply service area plan.

The City wastewater facility planning documents and *City of Waukesha Stormwater Management Plan* (Hey & Associates 2003) are consistent with *A Regional Water Quality Management Plan for Southeastern Wisconsin: Update and Regional Status Report* (SEWRPC 1995). These plans are based on planning criteria that are consistent with the City water supply service area plan.

Comment WS4

Provide an analysis of water conservation alternatives that includes all appropriate water conservation and efficiency measures (CEMs) and include a cost-effectiveness analysis of

the CEMs for each water supply alternative. Also provide documentation that the water conservation alternatives analysis complies with ch. NR 852 Water Conservation and Water Use Efficiency. (See Section 'C,' "Issues Related to Water Conservation & Efficiency" below).

Response

Refer to the Water Conservation Plan Supplement, Section 4.

Comment WS5

Provide additional, detailed information describing the method used to determine the percentage of water demand offset by water conservation (i.e., the selected 10 percent average day demand reduction that has been factored into the water demand forecasts).

Response

Refer to the Water Conservation Plan Supplement, Section 3.

Comment WS6

The environmental impact report for the City of Waukesha Water Supply states on page xviii that four public meetings have been held in 2010, including one meeting in a surrounding community and that "a compilation of comments received from the 2010 meetings and other public involvement processes will be provided to the department under separate submittal". Please submit the comments to the department for review.

Response

See Attachment WS6.

Comment WS7

Additional information is required to determine whether the unconfined deep aquifer is a viable technical water supply alternative for the City of Waukesha. The 2002 Future Water Supply Study states that the unconfined deep sandstone aquifer is a sustainable and adequate water supply. The 2002 Study also indicates that the unconfined aquifer is a cost-effective option. Further, the 2002 Study states that two area municipal systems, Oconomowoc and Dousman, have wells that maintain static water levels in the unconfined sandstone aquifer with well depths within 100 ft of ground surface. The 2002 Future Water Supply study states "the aquifer is thinner in this area, generally less than 1,000 feet, but the capacity in the wells is relatively high, generally over 1,000 gpm, due to the ample recharge and high permeability of the sandstone". The 2002 study also states that "water levels are not declining significantly in this area in spite of a large drawdown in the confined portion of the aquifer." Primary rejection of the unconfined deep water aquifer to the west as an alternative (as stated in the Water Supply Service Area Plan) relates to the alleged potential for legal challenges that would expose the City of Waukesha to potential damage claims from lake area homeowners and municipalities.

Updated cost information must be provided for this alternative. Also, provide additional information describing what the sustainable water yields from the unconfined deep aquifer would be as a potential water source for the City of Waukesha. What type of well network could be established? Provide information describing sustainable pumping rates from each well.

Response

See Attachment WS7, Unconfined Deep Aquifer Water Supply Evaluation.

Comment WS8

Although the Silurian dolomite is dense and has limits to storing and transmitting water, several municipalities have been successful in identifying areas within fractured zones of the dolomite aquifer that have resulted in producing wells with acceptable water yields. The 2002 Future Water Supply Study states that the probability of obtaining a reasonable well yield from the fractured Silurian dolomite aquifer occurs when the aquifer is at least 150–200 feet thick. The study also states that there are several municipalities in the area with wells producing from intervals of the fractured dolomite aquifer at a rate of 1,400 gpm, although capacities of 500–700 gpm are more common. There are areas in the northeast portion the City of Waukesha and areas southeast of the City of Waukesha where the dolomite aquifer is at least 200 feet thick.

Describe in greater detail the degree to which the areas to the northeast and southeast have been assessed for potential well locations. Also, provide any geophysical data that has been collected identifying any fractured zones in the Silurian dolomite.

Response

Ruekert & Mielke completed a letter report in March 2011 for the Waukesha Water Utility with extensive information on the Silurian dolomite aquifer near Waukesha. Refer to Attachment WS8. The report concluded that the Silurian dolomite aquifer has inadequate water supply to be a primary water source for Waukesha. However, since there is potential for some amount of water, the water source was included as part of the multiple water supply alternative (see response to Comment WS10).

Comment WS9

The shallow aquifer and Fox River alluvium alternative has been modeled to identify drawdown effects and environmental impacts based on the groundwater modeling study "*Results of Groundwater Modeling Study Shallow Groundwater Source, Fox River & Vernon Marsh Area*" March 2010. The groundwater model indicates a large drawdown in areas of the northeast portion of the Vernon Marsh Wildlife Area and a one foot drawdown identified in a large portion of the northern third of the Vernon Marsh Wildlife Area.

Provide in greater detail the natural community and habitat changes and impacts to wildlife and endangered resources to the Vernon Marsh Wildlife Area due to groundwater withdrawals from the shallow aquifer. Also provide an analysis that describes any potential mitigation actions that could lessen the impacts to the Vernon Marsh Wildlife Area.

Additional information may be requested after a more detailed review of the reported drawdown effects and environmental impacts based on the March 2010 groundwater modeling study.

Response

Refer to the attached memorandum "Vernon Marsh Wildlife Area Wetland Habitat Impact Analysis" for the response to this question.

Comment WS10

With respect to the technical and cost-effectiveness evaluation of the multiple water source alternative described in the Draft Technical Memorandum, “Review of Water Supply Alternatives”, attached to the letter from the City of Waukesha dated July 27, 2010, additional information will need to be provided to the department. How were the percentages of water supply from each water source determined? Has a maximum sustainable pumping rate been determined for each water source alternative in relation to minimal environmental impacts? While the Draft Technical Memorandum states that the total cost of the Multiple Water Supply Alternative uses the same criteria as the Application, there is no specific cost associated with each multiple water source presented in the memorandum. Please identify the costs associated with each water source that combine to make up the total cost represented in Table 1 of the Technical Memorandum. Are there other combinations of water sources that can be considered as part of a multiple water source alternatives analysis (e.g., different pumping rates of water sources or other sources not included in the alternative, such as the Silurian dolomite aquifer or river bank inducement)?

Response

Refer to Attachment WS10, “Multiple Source Water Supply Evaluation,” for the response to this question.

Comment WS11

The viability of riverbank inducement as a means to augment groundwater supplies in southeastern Wisconsin is being studied by Douglas Cherkauer, Professor Emeritus, UW-Milwaukee; Timothy J. Grundl, Professor, UW-Milwaukee; and Daniel Feinstein, Scientist, USGS. The City should be prepared to evaluate the riverbank inducement alternative based on the technical application and cost-effectiveness of implementing the alternative as a potential water supply for the City of Waukesha.

Response

Riverbank inducement was evaluated in the 2002 Future Water Supply report for Waukesha, and is evaluated as a major part of water supply Alternative 2 in the Application for Lake Michigan Water Supply. In addition, riverbank inducement is included in the multiple water source alternative (see Attachment WS10). In the May 2010 version of the Application and in the 2002 Future Water Supply report, we used the term “Fox River alluvium.” This is synonymous with “riverbank inducement.”

We have reviewed information on riverbank inducement by Black & Veatch, University of Wisconsin-Milwaukee (UW-M) and the United States Geologic Survey (USGS).¹ Their new groundwater model indicates that water can be obtained from riverbank inducement, and some of that water is induced from the Fox River. Our water supply alternatives for this source have similar assumptions. A comparison of their conditions to those of the Application’s Alternative 2 is presented below.

¹ Cost Analysis of a Conceptual Riverbank Inducement System Along the Fox River. Final Report. Black & Veatch for the University of Wisconsin-Milwaukee. April 2011.

Condition	Black & Veatch Report ²	Lake Michigan Application Alternative 2
Riverbank well total capacity	7.6 mgd (12 wells)	7.2 mgd (6 wells)
Groundwater withdrawal modeled	7.6 mgd (from 12 riverbank wells)	10.9 mgd (5.1 mgd from 4 riverbank wells, 5.8 mgd from Troy bedrock valley shallow aquifer wells)
Riverbank well total depth, ft	68–150	142–188
Riverbank well screen length, ft	12–50	Tops of screens range from 37 to 72 feet below ground surface, and the bottoms of screens range from 142 to 188 feet below ground surface. The total screen length ranges from 105 to 116 feet.
Distance from Fox River, ft	Within 200	150-500
Percent water induced from Fox River	50%	59%
Groundwater drawdown adversely impacting > 10 acres of wetlands	Yes	Yes
Treatment Requirement	Surface water	Surface water
Capital cost for water supply (\$million/mgd)	\$16.81	\$16.88

Based on this comparison, the Application evaluated a similar system of riverbank inducement water supply as the Black & Veatch report. Their groundwater modeling information does not change the Application conclusions on riverbank inducement as a potential water source.

Additional information on assumptions in the UW-M/USGS groundwater model and other considerations are in Attachment WS 11.

Several factors beyond hydrogeology and water quantity should be considered when evaluating riverbank inducement for public drinking water supply including:

- Riverbank inducement wells would be drawing water downstream of several wastewater treatment plant discharges, including Waukesha, Brookfield and Sussex. During dry periods, a significant portion of the Fox River flow is wastewater treatment plant effluent. Public health impacts, public perception, future regulations and multiple treatment barriers must be considered.
- If the water induced from the Fox River is reused (wastewater effluent discharged to the Fox River upstream of the wellfield), chlorides will continue to increase when the water is withdrawn from the river, used in homes with salt regenerated ion exchange softeners, and discharged back into the river upstream of the wellfield. Chlorides are already high in the wastewater plant effluent, reaching 500 mg/l to over 700 mg/l. Recycling this water and continuing to add salt will make meeting regulatory discharge limits more difficult and reduce drinking water quality. Removing chlorides by reverse

² Ibid.

osmosis is very expensive and not included in the cost estimates. Furthermore, reverse osmosis creates a liquid waste stream high in chlorides and other compounds. Therefore, chlorides are not eliminated from the environment and will remain an environmental concern. A Lake Michigan supply would reduce the total chloride load to the environment, as people choose not to soften their water.

- There are no drinking water supplies on the Fox River. Using the Fox River as a drinking water supply may change its current designation from a recreational water source to a public drinking water source. Future regulations may include more stringent phosphorus or chloride removal at wastewater plants and new drinking water contaminant regulations. The costs to remove chlorides or other contaminants from the water supply, and additional phosphorus or chloride at wastewater plants was not included in the Application analysis. Such costs would significantly increase the capital and operation/maintenance costs associated with this alternative.
- Several legal issues arise due to acquisition of property on the Fox River for the wells and water treatment plant including: environmental impact from groundwater drawdown and baseflow reduction in rivers and streams; potential claims from neighboring property owners from building settlement, foundation cracking, well deepening, pump replacement and water quality degradation. See Legal Exhibit A for additional information.

Wisconsin Statutes define a reasonable water supply alternative (see Legal Exhibit B). Based on this definition, riverbank inducement is not a reasonable water supply alternative to Lake Michigan because it creates greater adverse environmental impacts, is less protective of public health, and is more expensive.

Comment WS12

Additional information is necessary regarding costs associated with obtaining Lake Michigan water supply from Milwaukee, Oak Creek and Racine. A significant consideration for the City of Waukesha in future negotiations with both the City of Oak Creek and Racine will be the potential need for both cities to request an increased withdrawal to meet the long-term water demands for a Waukesha diversion. The need for an increased withdrawal would subject the City of Oak Creek or Racine to mandatory water conservation measures specified in ch. NR 852, Water Conservation and Water Use Efficiency. An increase in withdrawal would also subject the City of Oak Creek or Racine to the Compact's state decision-making standard. The cities of Oak Creek and Racine should be notified of the likely or potential need for an increased withdrawal along with the associated state decision-making standard and mandatory water conservation and efficiency requirements.

Response

In the City of Waukesha's discussions with the City of Oak Creek and City the Racine, the subject of the Great Lakes-St. Lawrence River Basin Water Resources Compact and the State of Wisconsin's implementation rules was reviewed. If an increase in the diversion of water from the Great Lakes basin is required to serve the City of Waukesha, the City of Oak Creek and the City of Racine understand the need to comply with the mandatory requirements recently published ch. NR 852 Water Conservation and Water Use Efficiency rule and the pending requirements in the draft rule, ch. NR 854 Water Supply Service Area Plans.

Comment WS13

The application contains no estimate of “sunk costs” or “one time” payments to Milwaukee, Oak Creek or Racine. The City of Waukesha has stated that the sunk costs are included as “contingency” costs in the May 2010 Waukesha Diversion Application. Please present the “sunk” or “one time” costs as a separate, specific cost item in the application.

Response

It is impossible to know if a “one-time” payment will be required from water suppliers before negotiations are concluded. If a one-time payment were to be required, it is impossible to know a dollar amount before negotiations are concluded. Industry cost estimating standards for dealing with unknown conditions such as this are to use a contingency as a percentage of the construction cost. This also applies to other unknown situations, such as the changing cost of materials and local market conditions in the construction industry. The contingency is more than \$25 million for the Milwaukee water supply alternative, plus an allowance of more than \$15 million for permitting, legal, and administrative costs. This \$40 million amount is sufficient to cover future unknown conditions that may or may not occur.

Comment WS14

The City of Waukesha will need access to utility rights-of-way to construct portions of both the water supply and return pipelines along areas owned or controlled by other public utilities [e.g. WE Energies and American Transmission Company (ATC)]. Provide information that documents that the City has obtained approval or will be able to obtain approval from the other utilities to access their rights-of-way to install pipeline. Also provide a description of how much of the alternative pipeline routes would share corridors with existing utilities and provide more detailed cost estimates related to construction in the corridors and, if applicable, the relocation of existing utility equipment. For example, if there are any known areas where there are physical restrictions (e.g. power & natural gas lines or limited access areas) to installation of the water supply pipelines, specifically identify those areas and describe how the pipelines would be installed in those areas. Provide information estimating the costs to install the pipeline where physical constraints are present and where the need for unique trenching or construction actions will be necessary.

Response

Waukesha has had preliminary discussions with WE Energies and ATC about pipeline route easements. These parties have agreed to share information as the project is approved and further defined. There was no indication that an easement would not be able to be negotiated. Additional information on the legal aspects of water utilities obtaining easements is in Legal Exhibit C.

Pipeline routes and utility corridors are discussed in the response to RF19.

Regarding pipeline cost estimates in utility corridors, detailed cost estimates are provided in Appendix M in the Application for Lake Michigan Water Supply. The cost estimates factored in road, highway, and water crossings for each mile of pipeline. In addition, specific unit costs were developed for pipeline construction in open country, low urban, medium urban and high urban areas. The unit costs account for other utilities in the same

pipeline corridor (gas, electric, phone, cable, sewer) and the occasional adjustment of pipeline routing to avoid obstacles. For example, the cost for a 36-inch-diameter pipe is estimated at \$320 per foot in low urban areas and \$592 per foot in high urban areas. The higher unit cost is used in congested areas with many other utilities.

Legal Exhibits

Exhibit A

Wisconsin ratified and approved The Great Lakes—St. Lawrence River Basin Water Resources Compact, as implemented and interpreted in Wisconsin Statutes sections 14.95, 281.346, and 281.348. Wis. Stat. § 281.343(1b). Consequently, Wisconsin manages and regulates new or increased withdrawals, consumptive uses, and diversions, including exceptions [of Great Lakes water] in accordance with the Great Lakes Compact. Wis. Stat. § 281.343(4d)(a). All new or increased diversions are prohibited, except as provided in Wisconsin Statutes section 281.343(4n). Wis. Stat. § 281.343(4m). According to section 281.343(4n)(c), "(c) *Straddling counties*. 1. **A proposal to transfer water to a community within a straddling county that would be considered a diversion under this compact shall be excepted from the prohibition against diversions, provided that it satisfies all of the following conditions: . . . d. There is no reasonable water supply alternative within the basin in which the community is located, including conservation of existing water supplies . . .**" Wis. Stat. § 281.343(4n) (emphasis added).

Potential Claims

For the technical and financial reasons set forth in the body of this document, there is no reasonable water supply alternative to Lake Michigan water within the basin in which Waukesha is located, including conservation of existing water supplies. Moreover, legal reasons also support a conclusion that there is no reasonable water supply alternative. All of the alternatives to Great Lakes water will have a negative impact on surrounding area surface waters and groundwater. These adverse effects likely are actionable regardless of whether groundwater is ultimately declared subject to the public trust doctrine. Though use of groundwater is basically regarded as a privilege, liability for such use may attach when such use is unreasonable.

'A possessor of land or his grantee who withdraws ground water from the land and uses it for a beneficial purpose is not subject to liability for interference with the use of water by another, unless

(a) The withdrawal of water causes unreasonable harm through lowering the water table or reducing artesian pressure,

(b) The ground water forms an underground stream, in which case the rules stated in sec. 850A to 857 are applicable, or

(c) The withdrawal of water has a direct and substantial effect upon the water of a watercourse or lake, in which case the rules stated in secs. 850A to 857 are applicable.'

Thus the rule preserves the basic expression of a rule of nonliability — a privilege if you will — to use ground water beneath the land. The formulation of the exception to this basic rule recognizes that there is usually enough water for all users so that apportionment is not necessary but that the problem is who shall bear

the costs of deepening prior wells, installing pumps, paying increased pumping costs, etc., necessitated by a lowering of the water table by a large user.

State v. Michels Pipeline Constr., Inc., 63 Wis. 2d 278, 302, 217 N.W.2d 339 (1974) (citation omitted).

In the current case, the "problem" of pumps would apply to the installation of larger horsepower pumps, and the "problem" of paying increased pumping costs would extend to maintenance.

Furthermore, the City may be subject to various takings claims. *See, e.g., Zealy v. City of Waukesha*, 201 Wis. 2d 365, 548 N.W.2d 528 (1996) (constructive taking occurs when government regulation renders property useless for all practical purposes); *Andersen v. Vill. of Little Chute*, 201 Wis. 2d 467, 549 N.W.2d 737 (Ct. App. 1996) (inverse condemnation proceedings seeking just compensation for a temporary taking of land for public use are based directly on Article I, section 13, of the constitution); *Eberle v. Dane Cnty. Bd. of Adjustment*, 227 Wis. 2d 609, 595 N.W.2d 730 (1999) (when regulatory taking claim is made, plaintiff must prove that government restriction or regulation is excessive and therefore constitutes taking and any proffered compensation is unjust); *E-L Enters., Inc. v. Milwaukee Metro. Sewerage Dist.*, 2010 WI 58, 326 Wis. 2d 82, 785 N.W.2d 409 (to state claim of inverse condemnation under Wisconsin Statutes section 32.10, facts alleged must show either that there was actual physical occupation by condemning authority or that government-imposed restriction deprived owner of all, or substantially all, of beneficial use of his/her property).

The City also could be subject to state common law causes of action, including negligence and/or nuisance. "[T]o establish a negligence claim, a [Wisconsin] plaintiff must prove: (1) the existence of a duty of care on the part of the defendant; (2) a breach of that duty of care; (3) a causal connection between the defendant's breach of the duty of care and the plaintiff's injury, and (4) actual loss or damage resulting from the injury." *Dyer v. Blackhawk Leather LLC*, 2008 WI App 128, ¶ 18, 313 Wis. 2d 803, 758 N.W.2d 167.

The term "nuisance" refers to a condition or activity which unduly interferes with the use of land or a public place . . . "nuisance" does not refer to the conduct that causes the harm, but to the type of harm caused by the conduct. Also, "nuisance" does not describe a cause of action for the interference, but rather a type of harm that may or may not be actionable . . . it is possible to have a nuisance and yet no liability. A nuisance is nothing more than a particular type of harm suffered; liability depends upon the existence of underlying tortious acts that cause the harm. . . .

Nuisances are divided into two types, depending on the nature of the interference: private or public. A private nuisance is a nontrespassory invasion of or interference with an interest in the private use and enjoyment of land. A public nuisance is a condition or activity which unreasonably interferes with the use of a public place or with the activities of an entire community. . . .

[t]he prerequisites to liability in either case are virtually identical. In either case, the plaintiff must demonstrate that the interference resulted in significant harm. . . .

The conduct giving rise to liability for creating or maintaining a nuisance can be either intentional or unintentional. A nuisance is the result of intentional conduct if the defendant either (a) acts for the purpose of causing it, or (b) knows that it is

resulting or is substantially certain to result from his conduct. It is not necessary that the defendant act with a malicious intent to harm the plaintiff; the defendant need only realize that the nuisance is substantially certain to result from his conduct, even if the conduct itself has a laudable purpose.

Liability can also arise from unintentional conduct. Where the plaintiff alleges the defendant unintentionally maintained or failed to abate a nuisance, the traditional rules for liability based on negligent conduct apply. The usual defenses in a negligence action are also available to the defendant.

There are situations where unintentional conduct can subject the defendant to strict liability regardless of the defendant's negligence . . .

Wis. J.I.-Civil 1920 (Nuisance: Law Note).

However, the City may be able to defend against some or all of these claims by invoking its sovereign immunity and/or its reasonable exercise of police power. *See, e.g., Cnty of Milwaukee v. Williams*, 2007 WI 69, ¶ 68, 301 Wis. 2d 134, 169, 732 N.W.2d 770 ("The police power of the state, exercised by municipalities under the authority of the legislature, extends to the public safety, health, morals, and general welfare."); *Rusk v. City of Milwaukee*, 2007 WI App 7, ¶ 19, 298 Wis. 2d 407, 727 N.W.2d 358, (citation omitted) ("The police power of the state is the inherent power of the government to promote the general welfare. It covers all matters having a reasonable relation to the protection of the public health, safety or welfare."); *State v. Cole*, 2003 WI 112 ¶ 22, 264 Wis. 2d 520, 665 N.W.2d 749 (citations omitted) ("Police power' is an inherent authority of state governments. It covers 'all matters having a reasonable relation to the protection of the public health, safety, or welfare.'"); Wis. Stat. § 160.001(7) ("A regulatory agency may take any actions within the context of regulatory programs established in statutes outside of this chapter, if those actions are necessary to protect public health and welfare or prevent a significant damaging effect on groundwater or surface water quality for present or future consumptive or nonconsumptive uses, . . .").

Finally, the City may find itself the subject of WDNR's attention, due to the agency's various environmental protection obligations, including, but not limited to, those set forth in Wisconsin Administrative Code NR chapters 102, 103, 117, 140, 809-812, and 820. The WDNR serves "as the central unit of state government to protect, maintain and improve the quality and management of the waters of the state, ground and surface, public and private. . . In order to achieve the policy objectives of this subchapter, it is the express policy of the state to mobilize governmental effort and resources at all levels, state, federal and local, allocating such effort and resources to accomplish the greatest result for the people of the state as a whole." Wis. Stat. § 281.11. *See Vill. of Sussex v. Dep't of Natural Res.*, 68 Wis. 2d 187, 228 N.W.2d 173 (1975) (protection of public health is a matter of state-wide concern over which legislature may exercise its police powers to insure a healthful water supply); *Lake Beulah Mgmt. Dist. v. Dep't of Natural Res.*, 2010 WI App 85, 237 Wis. 2d 222, 787 N.W.2d 926 (Sections 281.11 and 281.12 "expressly delegate regulatory authority to the DNR necessary to fulfill its mandatory duty 'to protect, maintain, and improve the quality and management of the waters of the state, ground and surface, public and private.'"); *Lake Beulah Mgmt. Dist. v. Vill. of E. Troy*, 2010 WI App 127, 329 Wis. 2d 641, 791 N.W.2d 385 (legislature's explicit grant of authority to WDNR preempts municipal ordinance regulating withdrawal of groundwater). *See, also*, Wis. Stat. § 1.11(2); Wis. Admin. Code NR § 1.95(2)(c).

Zoning

In addition to the legal claims that accompany the use of the alternatives (to Lake Michigan water), there are other obstacles to adoption of the alternatives. For example, although cities with a city plan commission and a zoning ordinance may exercise extraterritorial zoning power, "[e]xtraterritorial zoning jurisdiction means the unincorporated area within 3 miles of the corporate limits of a first, second or third class city, or 1 1/2 miles of a fourth class city or a village . . . The governing body of the city shall specify by resolution the description of the area to be zoned within its extraterritorial zoning jurisdiction sufficiently accurate to determine its location and such area shall be contiguous to the city . . ." Wis. Stat. § 62.23 (7a)(a). Thus, if the alternative is more than three miles from the City (e.g., the western well field alternative), the City may not have the ability to exercise the necessary controls over the alternative, leaving the alternative to the mercy of the government entity that does wield authority over the jurisdiction.

Diversion Prohibition Exception Standard

All new or increased diversions are prohibited, except as provided in Wisconsin Statutes section 281.343(4n). Wis. Stat. § 281.343(4m). Moreover, "[b]eginning on the compact's effective date, no person may begin a diversion, except as authorized under par. (c), (d), or (e) . . ." Wis. Stat. § 281.346(4)(a)(a).

Section 281.343 Exception Standard. According to Wisconsin Statute section 281.343(4n)(c) and (d):

(c) *Straddling counties.* 1. A proposal to transfer water to a community within a straddling county that would be considered a diversion under this compact shall be excepted from the prohibition against diversions, provided that it satisfies all of the following conditions:

- a. The water shall be used solely for the public water supply purposes of the community within a straddling county that is without adequate supplies of potable water;
- b. The proposal meets the exception standard, maximizing the portion of water returned to the source watershed as basin water** and minimizing the surface water or groundwater from outside the basin;
- c. The proposal shall be subject to management and regulation by the originating party, regardless of its size;
- d. There is no reasonable water supply alternative within the basin in which the community is located, including conservation of existing water supplies;
- e. Caution shall be used in determining whether or not the proposal meets the conditions for this exception. This exception should not be authorized unless it can be shown that it will not endanger the integrity of the basin ecosystem;
- f. The proposal undergoes regional review; and
- g. The proposal is approved by the council. Council approval shall be given unless one or more council members vote to disapprove.

2. A proposal must satisfy all of the conditions listed above. Further, substantive consideration will also be given to whether or not the proposal can provide sufficient scientifically based evidence that the existing water supply is derived from groundwater that is hydrologically interconnected to waters of the basin.

(d) Exception standard. Proposals subject to management and regulation in this subsection shall be declared to meet this exception standard and may be approved as appropriate only when the following criteria are met:

1. The need for all or part of the proposed exception cannot be reasonably avoided through the efficient use and conservation of existing water supplies;

2. The exception will be limited to quantities that are considered reasonable for the purposes for which it is proposed;

3. All water withdrawn shall be returned, either naturally or after use, to the source watershed less an allowance for consumptive use. No surface water or groundwater from outside the basin may be used to satisfy any portion of this criterion except if it:

a. Is part of a water supply or wastewater treatment system that combines water from inside and outside of the basin; and

b. Is treated to meet applicable water quality discharge standards and to prevent the introduction of invasive species into the basin;

4. The exception will be implemented so as to ensure that it will result in no significant individual or cumulative adverse impacts to the quantity or quality of the waters and water dependent natural resources of the basin with consideration given to the potential cumulative impacts of any precedent-setting consequences associated with the proposal;

5. The exception will be implemented so as to incorporate environmentally sound and economically feasible water conservation measures to minimize water withdrawals or consumptive use;

6. The exception will be implemented so as to ensure that it is in compliance with all applicable municipal, state, and federal laws as well as regional interstate and international agreements, including the Boundary Waters Treaty of 1909; and

7. All other applicable criteria in this subsection have also been met.

Wis. Stat. § 281.343(4n)(emphasis added).

Section 281.346 Exception Standard. According to Wisconsin Statute section 281.346(4)

(e) Straddling counties. 1. The department may approve a proposal under par. (b) for a new diversion or an increase in a diversion if the water diverted will be used solely for public water supply purposes in a community within a straddling county or, if a community is partly within a straddling county and partly within a county that lies entirely outside the Great Lakes basin, the water diverted will be used solely for public water supply purposes in the portion of the community that is within the straddling county and all of the following apply:

a. The community is without adequate supplies of potable water.

b. The proposal meets the exception standard under par. (f).

c. The proposal maximizes the amount of water withdrawn from the Great Lakes basin that will be returned to the source watershed and minimizes the amount of water from outside the Great Lakes basin that will be returned to the source watershed.

d. There is no reasonable water supply alternative within the watershed in which the community is located, including conservation of existing water supplies as determined under par. (g).

e. The proposal will not endanger the integrity of the Great Lakes basin ecosystem based upon a determination that the proposal will have no significant adverse impact on the Great Lakes basin ecosystem.

em. The proposal is consistent with an approved water supply service area plan under s. 281.348 that covers the public water supply system.

f. The department conducts a technical review.

g. The department notifies the regional body as required in s. 281.343 (4h) (b) 1.

h. The proposal undergoes regional review.

i. The department considers the regional declaration of finding in determining whether to approve the proposal.

j. The proposal is approved by the Great Lakes council.

2. In determining whether to approve a proposal under this paragraph, the department shall give substantive consideration to whether the applicant provides sufficient scientifically based evidence that the existing water supply is derived from groundwater that is hydrologically interconnected to waters of the Great Lakes basin. The department may not use a lack of hydrological connection to the waters of the Great Lakes basin as a reason to disapprove a proposal.

(f) Exception standard. A proposal meets the exception standard if all of the following apply:

1. The need for the proposed diversion cannot reasonably be avoided through the efficient use and conservation of existing water supplies as determined under par. (g).

2. The diversion is limited to quantities that are reasonable for the purposes for which the diversion is proposed.

3. An amount of water equal to the amount of water withdrawn from the Great Lakes basin will be returned to the source watershed, less an allowance for consumptive use.

3m. The place at which the water is returned to the source watershed is as close as practicable to the place at which the water is withdrawn, unless the applicant demonstrates that returning the water at that place is one of the following:

- a. **Not economically feasible.**
- b. **Not environmentally sound.**
- c. **Not in the interest of public health.**

4. No water from outside the Great Lakes basin will be returned to the source watershed unless all of the following apply:

- a. The returned water is from a water supply or wastewater treatment system that combines water from inside and outside the Great Lakes basin.
- b. The returned water will be treated to meet applicable permit requirements under s. 283.31 and to prevent the introduction of invasive species into the Great Lakes basin and the department has approved the permit under s. 283.31.
- c. If the water is returned through a structure on the bed of a navigable water, the structure is designed and will be operated to meet the applicable permit requirements under s. 30.12 and the department has approved the permit under s. 30.12.

4m. If water will be returned to the source watershed through a stream tributary to one of the Great Lakes, the physical, chemical, and biological integrity of the receiving water under subd. 3. will be protected and sustained as required under ss. 30.12, 281.15, and 283.31, considering the state of the receiving water before the proposal is implemented and considering both low and high flow conditions and potential adverse impacts due to changes in temperature and nutrient loadings.

5. The diversion will result in no significant adverse individual impacts or cumulative impacts to the quantity or quality of the waters of the Great Lakes basin or to water dependent natural resources, including cumulative impacts that might result due to any precedent-setting aspects of the proposed diversion, based upon a determination that the proposed diversion will not have any significant adverse impacts on the sustainable management of the waters of the Great Lakes basin.

6. The applicant commits to implementing the applicable water conservation measures under sub. (8) (d) that are environmentally sound and economically feasible for the applicant.

7. The diversion will be in compliance with all applicable local, state, and federal laws and interstate and international agreements, including the Boundary Waters Treaty of 1909.

(g) *Conservation and efficient use of existing water supplies.* The department shall promulgate rules specifying the requirements for an applicant for a new or increased diversion subject to par. (f) to demonstrate the efficient use and conservation of existing water supplies for the purposes of pars. (d) 2. b. and 3. b., (e) 1. d., and (f) 1., including requiring the applicant to document the water conservation planning and analysis used to

identify the water conservation and efficiency measures that the applicant determined were feasible.

(i) *Diversion amount.* In an approval issued under this subsection or a modification granted under this subsection to increase the amount of a diversion, the department shall specify a diversion amount equal to the quantity of water that is reasonable for the purposes for which the diversion is proposed.

Wis. Stat. § 281.346(4)(emphasis added).

The requirement in section 281.346(4)3m (emphasis added) contains a requirement that "[t]he place at which the water is returned to the source watershed is as close as practicable to the place at which the water is withdrawn" but does not provide further definition. This language has been interpreted to mean that the return water physical discharge place must be at the place where the withdrawal occurred and, to accomplish this, a pipeline must transport the water right up to the place where the "discharge" to Lake Michigan occurs. The statute, however, simply requires that the return flow water "end up" at the same place that it is withdrawn, such that the water could travel via stream to the area of the lake where withdrawal will occur. Under the latter scenario, focus is on the point of return within the source watershed and not the means or method of return. This latter scenario accords with the same section's provision for returning water via stream tributary: "**If water will be returned to the source watershed through a stream tributary . . .**" Wis. Stat. § 281.346(4)4m (emphasis added). Given that all of the subsection (4) diversion exception criteria must apply for an exception to be granted, subsection 4m's contemplation of water being "returned to the source watershed through a stream tributary" is important. It is not mandatory that the water be returned via a direct pipeline all the way to the Great Lake.

Regardless of how the phrase ("the place at which the water is returned to the source watershed is as close as practicable to the place at which the water is withdrawn") is interpreted, an exception to this return flow standard may apply if returning the water "at that place" is "[n]ot economically feasible" or "[n]ot environmentally sound" or "[n]ot in the interest of public health." However, the compact does not define "economically feasible" or "environmentally sound" with respect to analysis of return flow alternatives.¹ Consequently, this "standard" (including the public health interest component) is subjective and interpretations thereunder become a matter of degree, requiring a comparison of alternatives.

¹ The compact also provides that a proposal to transfer water to a community within a straddling county that would be considered a diversion is excepted from the prohibition against diversions if it satisfies the conditions set forth in Wis. Stat. § 281.343(4n)(c). Proposals will meet the exception standard if "[t]he exception will be implemented so as to incorporate environmentally sound and economically feasible water conservation measures to minimize water withdrawals or consumptive use." Wis. Stat. § 281.343(4n)(d)5.

The purpose of [the Environmentally Sound and Economically Feasible Water Conservation Measures] Standard provision is to encourage efficient use through demand reduction and supply-side Environmentally Sound and Economically Feasible Water Conservation Measures and incentives. Environmentally Sound and Economically Feasible Water Conservation Measures can be grouped into two general categories: 1) "hardware" devices or equipment; and, 2) behavior or management practices. Examples of Water Conservation Measures for different water use sectors are provided in Table 1 from the Handbook of Water Use and Conservation (Vickers, 2001). Conservation incentives are incentives that motivate water users to implement Environmentally Sound and Economically Feasible Water Conservation Measures. They can be classified into three categories: 1) educational, 2) financial, and 3) regulatory. Examples of conservation incentives are presented in Table 2 from the Handbook of Water Use and Conservation (Vickers, 2001).

The concept of "economic feasibility" also arises in the context of other environmental laws. For example, the Environmental Protection Agency (the "EPA") has evaluated the economic feasibility of: mercury control, energy sources (for example, shale oil, solar, wind, biomass gasification), recycling, air pollution controls, and water pollution controls. The Supreme Court recently found that the EPA "permissibly relied on cost-benefit analysis in setting the national performance standards and in providing for cost-benefit variances from those standards as part of the Phase II regulations." *Entergy Corp. v. Riverkeeper, Inc.*, 129 S. Ct. 1498, 1506 (2009) (interpreting Clean Water Act best control technologies.) And, in the Clean Air Act context, "[b]est available control technology" is an emission limitation based on the maximum degree of reduction of each pollutant . . . taking into account energy, environmental, and economic impacts and other costs . . . is achievable for such facility . . ." 42 U.S.C. § 7479(3).

In its NR 700 rule series, the WDNR requires that responsible parties use specified criteria to evaluate appropriate remedial action options "to determine which remedial action option constitutes the most appropriate technology or combination of technologies to restore the environment, to the extent practicable, within a reasonable period of time and to minimize the harmful effects of the contamination to the air, land or waters of the state." Wis. Admin. Code s. NR 722.07(3)(a)(2). According to a Note to section NR 722.07, "[t]he purpose of the technical and economic feasibility evaluation is to evaluate a range of remedial action options suitable for a particular site or facility to determine the practicability of implementing those options. If a particular option is not suitable for a particular site or facility . . . it should not be evaluated."

It is likely that most analysts would agree that application of the subjective economic feasibility standard in the current situation leads to a conclusion that it is not economically feasible to return Waukesha's return flow water via pipeline all the way to Lake Michigan. Returning the water all the way to the lake would increase the return flow cost by 50% (over the already doubled cost of the Lake Michigan supply), as compared to allowing the water to be discharged into Underwood Creek. This substantially *more* costly option would also be *less* environmentally sound than returning flow to the lake via Underwood Creek, because: environmental harm would increase during the pipe construction process; and, the mixing effect of the creek and the river, as well as the treatment effect of assimilation, would have been a net environmental positive overall. Both are in the interest of public health.

Exhibit B

Wisconsin Statute 281

According to Wisconsin Statute section 281.346:

The department may approve a proposal under par. (b) for a new diversion or an increase in a diversion if the water diverted will be used solely for public water supply purposes in a community within a straddling county or, if a community is partly within a straddling county and partly within a county that lies entirely outside the Great Lakes basin, the water diverted will be used solely for public water supply purposes in the portion of the community that is within the straddling county and all of the following apply:

- a. The community is without adequate supplies of potable water.
- b. The proposal meets the exception standard under par. (f).
- c. The proposal maximizes the amount of water withdrawn from the Great Lakes basin that will be returned to the source watershed and minimizes the amount of water from outside the Great Lakes basin that will be returned to the source watershed.
- d. **There is no reasonable water supply alternative within the watershed in which the community is located**, including conservation of existing water supplies as determined under par. (g).
- e. The proposal will not endanger the integrity of the Great Lakes basin ecosystem based upon a determination that the proposal will have no significant adverse impact on the Great Lakes basin ecosystem.
- em. The proposal is consistent with an approved water supply service area plan under s. 281.348 that covers the public water supply system.
- f. The department conducts a technical review.
- g. The department notifies the regional body as required in s. 281.343 (4h) (b) 1.
- h. The proposal undergoes regional review.
- i. The department considers the regional declaration of finding in determining whether to approve the proposal.
- j. The proposal is approved by the Great Lakes council.

Wis. Stat. § 281.346(4)(e)(emphasis added). A "[r]easonable water supply alternative' means a water supply alternative that is similar in cost to, and as environmentally sustainable and protective of public health as, the proposed new or increased diversion and that does not have greater adverse environmental impacts than the proposed new or increased diversion." Wis. Stat. § 281.346(1)(ps).

Exhibit C

Easements

The City may rely on several statutes to ensure that it has the ability to construct a return flow pipeline. First, the statutes require owners of transmission equipment/property to allow public utilities to use the equipment/property in the following circumstances:

Any person who owns transmission equipment and property shall permit, for reasonable compensation, the use of the transmission equipment and property by any public utility or telecommunications provider if public convenience and necessity require such use and if the use will not result in irreparable injury to any owner or user of the transmission equipment and property or in any substantial detriment to the service to be rendered by the owner or user.

Wis. Stat. § 196.04(1)(b)1 (emphasis added).

Additionally, Wisconsin Statute section 196.58 includes several potentially applicable provisions:

(1)

...

(b) Require of any public utility any addition or extension to its physical plant within the municipality as shall be reasonable and necessary in the interest of the public, and designate the location and nature of the addition or extension, the time within which it must be completed, and any condition under which it must be constructed, subject to review by the commission under sub. (4).

...

(5) The commission shall have original and concurrent jurisdiction with municipalities to require extensions of service and to regulate service of public utilities. Nothing in this section shall limit the power of the commission to act on its own motion to require extensions of service and to regulate the service of public utilities.

...

(7)

(a) If a municipality operating a water system seeks to serve consumers of an area which is part of the municipality and in the same county, but in order to serve such consumers it is necessary or economically prudent for the municipality to install mains, transmission lines, pipes or service connections through, upon or under a public street, highway, road, public thoroughfare or alley located within the boundaries of any adjacent municipality, **the municipality seeking the installation may file a petition with the clerk of the legislative body of the adjacent municipality requesting approval for the installation of the mains, transmission lines, pipes or service connections.** The governing body of the adjacent municipality shall act on the petition within 15 days after the petition is filed. **If the governing body of the adjacent municipality fails to act within the 15-day period, the**

petition shall be deemed approved and the municipality may proceed with the installations required for service to its consumers. If, however, the governing body of the adjacent municipality rejects the petition, the municipality may make application to the commission for authority to install within the boundaries of the adjacent municipality the installations necessary to provide service to its consumers. The commission shall hold a hearing upon the application of the municipality. If the commission determines that it is necessary or economically prudent that the municipality seeking to serve its consumers make the installations within the boundaries of the adjacent municipality, the commission shall promptly issue an order authorizing the municipality to proceed to make the installation. In the order, the commission may establish the manner of making the installation.

(b) A municipality making an installation under this section shall restore the land on or in which such installation has been made to the same condition as it existed prior to the installation. Failure to make the restoration shall subject the municipality to an action for damages by the adjacent municipality. **The adjacent municipality may require a performance bond from the municipality seeking to make the installation. If no agreement can be effected between the municipalities as to the amount of the performance bond, the commission shall determine the amount of the bond. If the commission issues an order authorizing an installation under this subsection, the commission shall determine the amount of the performance bond which shall be required of the applicant municipality.**

Wis. Stat. § 196.58 (emphasis added).

The City also might cite the "Cities" statute in support of its effort to obtain easements or other property rights.

Confirming all powers granted to it and in furtherance thereof, **the governing body of any city is expressly authorized to acquire** by gift, purchase or condemnation under ch. 32 any and all property rights in lands or waters, including **rights of access and use, negative or positive easements**, restrictive covenants, covenants running with the land, scenic easements **and any rights for use of property of any nature whatsoever, however denominated, which may be lawfully acquired for the benefit of the public or for any public purpose**, including the exercise of powers granted under s. 62.23; and may sell and convey such easements or property rights when no longer needed for public use or protection.

Wis. Stat. § 62.22(1m) (emphasis added).¹

This provision should be interpreted in light of the legislature's intent "to giv[e] to cities the largest measure of self-government compatible with the constitution and general law" such that sections "62.01 to 62.26 **shall be liberally construed in favor of the rights, powers and privileges of cities to promote the general welfare, peace, good order and prosperity** of such cities and the inhabitants thereof." Wis. Stat. § 62.04 (emphasis added). As such,

¹"The governing body of any city which has created a city plan commission under sub. (1) and has adopted a zoning ordinance under sub. (7) may exercise extraterritorial zoning power as set forth in this subsection. . . . Extraterritorial zoning jurisdiction means the unincorporated area within 3 miles of the corporate limits of a first, second or third class city, or 1 1/2 miles of a fourth class city or a village. . . ." Wis. Stat. § 62.23(7a).

[T]he council shall have the management and control of the city property, finances, highways, navigable waters, and the public service, and shall have power to act for the government and good order of the city, for its commercial benefit, and for the health, safety, and welfare of the public, and may carry out its powers by license, regulation, suppression, borrowing of money, tax levy, appropriation, fine, imprisonment, confiscation, and other necessary or convenient means. The powers hereby conferred shall be in addition to all other grants, and shall be limited only by express language.

Wis. Stat. § 62.11(5).

Under Wisconsin Statutes Chapter 66 (General Municipality Law), Subchapter VIII (Public Utilities), a "city owning water . . . plant or equipment may serve persons or places outside its corporate limits . . . and may interconnect with another municipality, whether contiguous or not, and for these purposes may use equipment owned by the other municipality." Wis. Stat. § 66.0813(1).

The corporate statute also provides certain rights to the City. "**All public utilities shall have the right to cross the lands or easements of the corporation** with any lines at such reasonable place and in such reasonable manner, either over or under the project, as the corporation may direct upon payment of damages to the corporation. **In cases of dispute, utilities shall have the right to condemn easements under ch. 32** but such easements shall not conflict with the planned operation, or operation of the project." Wis. Stat. § 182.37 (emphasis added).

Moreover, the City could seek easements over state land:

(1) Every board, commission, department and agency of the state having real estate belonging to the state under its control **may grant easements in said property for public utility service through, over, along or to said property, including without limitation by enumeration the necessary poles, wires, structures, lines, conduits, pipes or pipe lines for heat, light, water, gas, sewer, power, telecommunications, telegraph and transmission of messages.**

(2) Every such board, commission, department and agency may petition or join in a petition for and on behalf of the state as the owner of such property to annex or detach the same or any part or parts thereof to or from an adjoining municipality.

Wis. Stat. § 24.40 (emphasis added).

Finally, Wisconsin Statutes chapter 198 allows municipal water districts to obtain easements or otherwise facilitate the construction of a return flow pipeline through other communities or private property. For example, such districts:

[S]hall have power and authority to own, acquire, and, subject to the restrictions applying to a municipality under s. 196.50 (4), to construct any water utility or portion thereof, to operate, in whole or in part, in the district and to construct any addition or extension to any such utility. **For such purpose the district is granted and shall have and exercise the right freely to use and occupy any public highway, street, way or place reasonably necessary to be used or occupied for the construction, operation or maintenance of such utility or any part thereof,** subject, however, to the obligation of the district to replace said grounds in the same condition as they previously were in.

Wis. Stat. § 198.22(6)(emphasis added). *See also* Wis. Stat. § 198.22(8) (board has power and authority to purchase, lease, sell, convey and mortgage property of district and to authorize and order all instruments, contracts, deeds or mortgages to be executed on behalf of district).

Furthermore, a municipal water district "**may take by eminent domain, grant, purchase, gift, devise, or lease or otherwise acquire and hold real and personal property of every kind within or without the district** necessary to the full or convenient exercise of its powers, **and may make contracts and do such other acts as shall be necessary and proper** in the exercise of the powers and privileges granted and in the performance of the duties charged upon it and exercise such other or different powers as shall be conferred by law." Wis. Stat. § 198.12(1)(emphasis added). *See also* Wis. Stat. § 198.14(8).

Exhibit D

Wisconsin Groundwater Management Areas and High Capacity Wells

In 2004, Wisconsin's groundwater protection law (2003 Wisconsin Act 310) took effect. In addition to creating a Groundwater Management Areas ("GMA") framework, 2003 Wisconsin Act 310 "also expanded the state's scope of authority over high capacity wells to include factors in addition to impacts on nearby municipal water supplies. Specifically, the law requires the [WDNR], as part of its approval process, to consider impacts to trout streams, springs, outstanding resource waters and exceptional resource waters and impacts from wells with high water loss." December 2006 Wisconsin Groundwater Advisory Committee *Report to the Legislature on Groundwater Management Areas* at 1. "The principal objective of designating GMAs is to encourage management strategy among the state, local government units, regional planning commissions, and public and private users of groundwater to address problems caused by over-pumping of the deep aquifer." *Id.*

In order for local units of government to effectively manage the groundwater resources within designated groundwater management areas the Groundwater Advisory Committee concluded that comprehensive groundwater management plans will need to be developed in each area. . . .

2003 Wisconsin Act 310 established the concept of groundwater management areas but did not provide additional detail concerning implementation of the concept. Rather, the Act directed the Groundwater Advisory Committee to consider management of groundwater resources within groundwater management areas and identify future legislation that may be needed to implement the conceptual management framework.

Id. at 9.

The Groundwater Coordinating Council recently reported that "the DNR has begun implementing the new law and the Groundwater Advisory Committee has addressed specific policy issues related to groundwater management planning and the overall effectiveness of the law. There is a need for proactive regional groundwater planning in certain areas of the state." 2010 *Groundwater Coordinating Council Report to the Legislature*, at 9.

Wisconsin Statute section 281.34 and Wisconsin Administrative Code chapter NR 820 govern groundwater quantity protection in Wisconsin. Chapter NR 820 has three subchapters: I, General Provisions; II, Groundwater Management Areas; and, III, Environmental Review of High Capacity Well Applications. The Groundwater Management Areas subchapter contains only one section, NR 820.20, which specifies the areas that are designated as groundwater management areas.^{[1][1]} Waukesha County is part of the

[1] "Groundwater management area" means "a multi-jurisdictional area including towns, cities, villages and counties within which the level of the groundwater potentiometric surface in any of its underlying aquifers has been reduced by 150 feet or

Southeast Wisconsin Groundwater Management Area. Wis. Admin. Code § NR 820.20. Section 820.20 does not contain requirements for the groundwater management areas.

Nevertheless, unless an exemption applies, subchapter III's high capacity well requirements could govern high capacity wells that the City of Waukesha installs as an alternative to a Lake Michigan water supply.

Public utility wells. Sections NR 820.30 to 820.32^[2]^[2] do not apply to proposed high capacity wells that are water supplies for public water systems operated by a public utility, as defined by s. 196.01, Stats., engaged in supplying water to or for the public, if the department determines that there is no other reasonable alternative location for the well and **includes in the approval conditions that ensure that the environmental impact of the well is balanced by the public benefit of the well related to public health and safety. Conditions of the approval for the well may include, but are not limited to, conditions as to location, depth, pumping capacity, rate of flow, and ultimate use.**

Wis. Admin. Code § NR 820.33 (emphasis added). *See also* Wis. Stat. § 281.34(5)(a) ("If the department determines that a proposed high capacity well may impair the water supply of a public utility engaged in furnishing water to or for the public, the department may not approve the high capacity well unless it is able to include and includes in the approval conditions, which may include conditions as to location, depth, pumping capacity, rate of flow, and ultimate use, that will ensure that the water supply of the public utility will not be impaired.").

Even if the City's high capacity wells are exempt from some of the high capacity well requirements (*i.e.*, if the WDNR determines that there is no other reasonable alternative location for the well and if the WDNR includes in its high capacity well approval the aforementioned "balancing" conditions), the wells would be required to meet the WDNR's conditions of approval (including, but not limited to, location, depth, pumping capacity, rate of flow, and ultimate use). Consequently, the WDNR has discretion to condition the approval of the City's high capacity well(s) on a number of factors. Though this statutory and regulatory framework appears to favor public utility wells over private wells, there is no indication of how the WDNR will resolve the conflicts that are likely to arise when more than one municipality has wells in the same area. It appears, though, that the WDNR recognizes the potential for conflict, because the WDNR requires that an application for approval of a high capacity well within a groundwater protection area include a "description of all other wells on the high capacity property including location relative to the class 1, 2 or 3 trout stream, or outstanding or exceptional resource water, maximum pumping capacity, estimated actual annual pumpage for each well and frequency of pumping for each well." Wis. Admin. Code § NR 820.30(1)(e) .

more from the level at which the potentiometric surface would be if no groundwater withdrawals had occurred." Wis. Admin. Code § NR 820.12(8).

[2] These requirements address: review periods (NR 820.29); high capacity wells in groundwater protection areas (NR 820.30); high capacity wells near springs (NR 820.31); high water loss (NR 820.32); and, public utility wells (NR 820.33).

The WDNR, more likely than not, will restrict the pumping capacity and flow rate of the City's (newer) well(s), in order to protect the pre-existing municipal wells. In the current case, this means that the City's new wells could be constrained based upon their impact on the wells that preceded the City (as well as the others conditions). If the City is unable to meet these or other conditions or standards, then the WDNR might rescind the "permit." Approval of a high capacity well "remains in effect unless the [WDNR] modifies or rescinds the approval because the high capacity well or the use of the high capacity well is not in conformance with standards or conditions applicable to the approval of the high capacity well." Wis. Stat. § 281.34(7).

Attachment WS1
Meetings That Took Place between
2006 and 2011

Thursday, February 24, 2011

Waukesha Water Commission

Agenda Item #8 – Approve New Water Supply Development Contract – discuss and approve a contract with Martin Schreiber and Associates to move the application forward.

Agenda Item #11 – Update on the Great Lakes Application – discussion on the status for long-term water supply plan and / progress of the Great Lakes Application.

Thursday, January 20, 2011

Waukesha Water Commission

Agenda Item #3 – Approve Reinhart Boerner Amendment – Approve amendment to contract with Reinhart Boerner Law Firm for 2011. Agenda Item #7 – Approve CH2M HILL Contract Amendment – Approve amendment with CH2M HILL for time and materials in working with WWU in response to the DNR. Agenda Item #17 – Review the History of Water Rates of Potential Water Suppliers – A “draft” of the Water Rate Comparison was presented for rate increases per year for Milwaukee, Oak Creek, Racine, and Waukesha, including PSC information as of July 2010 for current Wisconsin volume wholesale rates.

Agenda Item #18 – Update on the future water supply Great Lakes Application – discussed the current status of the Great Lakes Application and communication with the WDNR staff related to the WDNR December 2, 2010 WDNR review comments letter.

Thursday, December 15, 2010

Waukesha Water Commission

Agenda Item #9 – Update on the Great Lakes Application – discussion on working with our consultants on the DNR response.

Thursday, November 18, 2010

Waukesha Water Commission

Agenda Item #7 – Approve 2011 Operating Budget, 2011 CIP, and 5-Year Financial Plan – discussion regarding the significant budget items which included the Great Lakes application and associated long-term water supply planning projects.

Thursday, October 21, 2010

Waukesha Water Commission

Agenda Item #12 – Discuss 2011 Budget, Capital Improvement Plan, Operational Budget, and Financial Plan – discussion regarding the significant budget items which included the Great Lakes application and associated long-term water supply planning projects.

Tuesday, September 21, 2010

Waukesha Water Commission

Agenda Item #7 – Discuss Capital Improvement Budget – discussion regarding the significant budget items which included the Great Lakes application and associated long-term water supply planning projects.

Tuesday, July 27, 2010

Common Council/Waukesha Water Commission

Consideration and approval of Council communication with WDNR Department of Natural Resources regarding Great Lakes Water Application and technical report by CH2M HILL of water supply alternatives by CH2M HILL. – After receiving public comment, the Common Council moved to approve correspondence a communication with the WDNR Department of Natural Resources regarding the long-term water supply alternatives analysis by CH2M

HILL, and the Great Lakes Water Application. and technical report by CH2M Hill of water supply alternatives and the Common Council authorized Common Council President Paul Ybarra to sign such correspondence letter.

Thursday, July 15, 2010

Waukesha Water Commission

Agenda Item #9 – Discuss Great Lakes Application process in light of – discussion regarding the recent communication between the mayor and the WDNR and that it did not reflect the views and the direction provided by the water commission. and the majority of the commission agrees with the policy/direction previously provided to staff as which is the official position on the Great Lakes Application. ; Common Council concurred and approval of that position; Cost estimate; Well permitting issues related to development of new shallow aquifer water supply wells on the Lathers site; water rates and PSC regulations.

Thursday, June 24, 2010

Waukesha Water Commission

Agenda Item #3 – Approve/Ratify Future Water Supply Contracts – Discuss Great Lakes Application process – discussion on the Reinhart law firm contract for legal services and the work they were completing for the Utility related to long-term water supply planning. the Great Lakes Water Application. There was also discussion on a change order to the CH2M HILL contract for work related to the Great Lakes Application. for Great lakes Water. This included the areas of water supply alternative analysis, return flow analysis, environmental/habitat analysis and public education campaign. Agenda Item #12 – Discuss long-term water supply related Great Lakes Application Process – discussion on the process of the Great Lakes application including the topics: Alternative plans if the Great Lakes application is denied; recent correspondence between the mayor and WDNR, the mayor and the general manager and the city attorney and mayor; the direction the utility commission provided to staff; and the Application process between the Water Utility/City and WDNR.

Thursday, May 20, 2010

Waukesha Water Commission

Agenda Item #3 – Ratify Boardman Law Firm Change Order – Agenda Item #15 – Discuss Water Supply Status Report – discussion on the status of the existing wells and water supply facilities and the need for a new water supply updating the status of the search. Agenda Item #16 – Discuss Great Lakes Application process – discussion on the Boardman Law firm contract as it related to the application for Great Lakes Application Water and the compact compliance with the Great Lakes-St. Lawrence River Basin Water Resources Compact. chapter in the application.

Thursday, April 8, 2010

Common Council/Waukesha Water Commission

Consideration and possible action on Great Lakes Water Application – After receiving public comment and a lengthy discussion which included all aspects of the Great lakes Application, the Common Council passed the motion to approve submission of the draft Great Lakes Water Application to the State of Wisconsin Department of Natural Resources, as provided under 2007 Act 227 of the Great Lakes Compact Implementation Law, subject to non-substantive or organizational changes, with the understanding that modification or additional information may also be required an anticipated part of the application process.

Thursday, March 22, 2010*Wauwatosa*

Open House on long-term water supply alternatives and the Great Lakes Application-Utility staff and consultants participated in an Open House on the Application for Great Lakes Water at the Wauwatosa City Hall. All aspects of the application were presented at stations with staff present to answer any questions from the public and Wauwatosa residents in attendance.

Thursday, March 18, 2010*Waukesha Water Commission*

Agenda Item #4 – Discuss/ Approve Great Lakes Water Application – discussion on the background information on the Great Lakes Water Application and a recommendation to continue the application process to ensure this long-term water supply alternative is available for the City of Waukesha residents. Also discussed were the history of actions taken with the Water Commission, the timeline of dual alternatives – Plan B, the amount of water being requested and written comments regarding the application. Agenda Item #7 -- Discussion and Approval of Change Order No. 2 to CH2M HILL Water Supply Contract. – discussion on the contract with CH2M Hill and their work on and supporting of the Application for Great Lakes water.

Monday, March 8, 2010*Committee of the Whole/Waukesha Water Commission*

Open House informational forum where consultants and staff will provide the public with information related to long-term water supply alternatives and the Great Lakes Water Application. Meeting agenda (1) the update of the Draft Great Lakes Application for Great Lakes Water by the General Manager and the Utility Consultants; and (2) public comments and questions. An open house was held with stations on different components of the Application for Great Lakes Water followed by a presentation on the available water supply alternatives for the City and the updated Draft Application for Great Lakes Water by the Water Utility General Manager and consultants followed by public comments and questions.

Thursday, February 25, 2010*Committee of the Whole/Waukesha Water Commission*

Open House informational forum where consultants and staff will provide the public with information related to long-term water supply alternatives and the Great Lakes Water Application – An open house was held with stations on different components of the Application for Great Lakes Water followed by a presentation on the available water supply alternatives for the City and the updated Draft Application for Great Lakes Water by the Water Utility General Manager and consultants followed by public comments and questions.

Thursday, January 28, 2010*Committee of the Whole/Waukesha Water Commission*

Agenda Item #1 – Presentation of the Draft Application for Great Lakes Water by the General Manager and Utility Consultants – The Waukesha Water Utility General Manager and the Utility Consultants provided a presentation on the Draft Application for Great Lakes Water. Public comments and questions were welcomed.

Thursday, January 21, 2010*Waukesha Water Commission*

Agenda Item #5 – Approve Resolution #1-10 Well Protection Agreements Relating to the Development of new shallow aquifer wells City Wells on the Lathers parcel – discussion and approval of a resolution related to well protection agreements for the properties impacted from well development on the Lathers parcel. Agenda Item #6 – Approve Future Water Supply Contracts – discussion and approval of contracts with CH2M HILL and with Martin Schreiber and Associates related to the development and support work associated with an Application for Great Lakes Water.

Thursday, December 17, 2009

Waukesha Water Commission

Agenda Item #12 – Approve a Resolution to Develop Well Protection Agreements Relating to the Development of City Wells on the Lathers parcel Property – discussion on the acquisition of the Lathers parcel as an alternatives, and potentially redundant long-term water supply / alternative if the Great Lakes Application was not approved. and the development of well protection agreements for wells that would potentially be negatively impacted by the development of high capacity wells is an issue.

Thursday, November 19, 2009

Waukesha Water Commission

Agenda Item #5 – Approve 2010-2014 Five-Year Capital Improvement Plan Agenda Item #7 – Approve 2010 Budget – Agenda Items #5 and #7 included discussion regarding the significant budget items which included the Great Lakes Application and associated water supply planning projects. Agenda Item #11 – Approve First Change Order to CH2M HILL Contract – discussion on the CH2M HILL contract and their work on long-term water supply planning and the application for the Great Lakes Water.

Thursday, October 15, 2009

Waukesha Water Commission

Agenda Item #14 – Discussion 2009-2013 Five-Year Capital Improvement Plan Agenda Item #15 – Discuss 2009 Budget – Agenda Items #14 and 15 included discussion regarding the significant budget items, which included the Great Lakes application and associated water supply planning projects.

Monday, October 12, 2009

Committee of the Whole/Waukesha Water Commission

Presentation of the Preliminary Draft of the Great Lakes Application – The Waukesha Water Utility General Manager and the Utility Consultants provided a presentation on the City's long-term water supply issues and the Draft Great Lakes Application for Great Lakes Water. Public comments and questions were welcomed.

Thursday, September 17, 2009

Waukesha Water Commission

Agenda Item #9 – Discuss/ Approve Procedural Requirements for Water Supply Plans – discussion of the water supply plan that was required to be provided as part of the Great Lakes Application for Great Lakes Water. It also included a discussion of the delineated water supply service area, n service area population projections, and, water demand forecasts. projections and service area. Agenda Item #10 – Discuss 5-Year Capital Improvement Plan – discussion regarding the significant budget items which included the Great Lakes \Application and associated long-term water supply planning projects.

Thursday, May 21, 2009*Waukesha Water Commission*

Agenda Item #6 – Approve Resolution to Join the Southeastern Wisconsin Watersheds Trust (SWWT) – discussion on the SWWT and joining the trust. This relates specifically to Great Lakes water and return flow options involving the Underwood Creek and the Menomonee River. Agenda Item #10 – Approve Utility Membership to the Milwaukee 7 Water Council – discussion about joining the M7 Water Council. This relates specifically to the City of Waukesha's application for Great Lakes Application water.

Thursday, April 16, 2009*Waukesha Water Commission*

Agenda Item #11 – Discuss Water Supply Status Report – discussion on the status of the existing wells and water supply facilities and the need for a new water supply updating the status of the search.

Thursday, March 24, 2009*Waukesha Water Commission*

Agenda Item #9 – Approve Water Modeling Agreement with MMSD – discussion regarding the water modeling required for the return flow of wastewater to Underwood Creek and this study being completed to address the water quality related concerns. Agenda Item #13 – Discuss Stipulated Order and Operation and Monitoring Plan – general discussion by the commission that reviewed the terms and requirements of the Stipulated Order entered into with the Department of Justice as a result of the radium compliance issue and how the development of a new water supply and the Great Lakes water application fit into this plan.

Tuesday, March 3, 2009*Common Council*

Agenda Item #VI. A. A motion will be made to go into closed session pursuant to Section 19.85(1)(g) Wis. Stats to discuss with legal counsel possible settlement with the Department of Natural Resources related to radium. – This item included a discussion of the details of the Consent order with the Common Council. Once they returned to open session they made a motion to enter into the agreement with the Department of Justice and also discussed the settlement as it was" in the best interest of the citizens of Waukesha."

Thursday, February 19, 2009*Waukesha Water Commission*

Agenda Item #13 – Review and Approve Waukesha Water Utility Statement on the SEWRPC Water Supply Study – discussion regarding the SEWRPC regional water plan and the comments that would be made with regards to the plan recommendations by the water commission. The commission also reviewed a proposed letter to be sent to SEWRPC supporting the plan. Agenda Item #14 – Approve Reinhart Boerner Professional Services Agreement – discussion on the history with Reinhart Boerner and the Professional Services provided by the firm including the services related to the development of a new water supply.

Thursday, January 15, 2009*Waukesha Water Commission*

Agenda Item #9 – Approve New Water Supply Development Contracts – discussion regarding the new water supply contracts with Martin Schreiber and Associates and GeoSyntec. The discussion included the topics of the Great Lakes Application, Public

Outreach, the Conservation Plan, Educating the political area/region and advocacy of the Waukesha position.

Thursday, November 20, 2008

Waukesha Water Commission

Agenda Item #7 – Approve 2009 Budget Agenda Item #8 – Approve 2009-2013 Five-Year Capital Improvement Plan –

Agenda Items 7 and 8 – discussion regarding the significant budget items which included the Great Lakes Application and associated long-term planning projects.

Thursday, October 16, 2008

Waukesha Water Commission

Agenda Item #7 – Approve Change Order #1 to GeoSyntec Consultants Contract – discussion of Geosyntec's contract and their role with the Great Lakes application. Agenda Item #9 – Discussion 2009-2013 Five-Year Capital Improvement Plan Agenda Item #11 – Discuss 2009 Budget – Agenda Items 9 and 11- discussion regarding the significant budget items which included the Great Lakes Application and associated long-term planning projects.

Thursday, September 25, 2008

Waukesha Water Commission

Agenda Item #12 – Update on ProCorp Pilot Project discussion on a pilot project for radium removal at one of our non-compliant radium wells as well as a discussion on where this potential technology could be utilized. Agenda Item #13 – Discuss 2009-2013 Five-Year Capital Improvement Plan. Agenda Item #15 – Discuss 2009 Budget – Agenda Items #13 and #15 – discussion regarding the significant budget items which included the Great Lakes Application and associated long-term projects.

Thursday, August 21, 2008

Waukesha Water Commission

Agenda Item #13 – Discuss 5-Year CIP – discussion regarding the significant budget items which included the Great Lakes application and associated water supply planning projects.

Thursday, May 22, 2008

Waukesha Water Commission

Agenda Item #11 – Discuss Great Lakes Compact – discussion on the Great Lakes Compact legislation and the implementation legislation and how it affected the potential Great Lakes Application from the City of Waukesha.

Tuesday, April 17, 2008

Waukesha Water Commission

Agenda Item #12 – Discuss Water Supply Status Report – discussion on the status of the existing wells and water supply facilities and the need for a new water supply updating the status of the search.

Thursday, March 20, 2008

Waukesha Water Commission

Agenda Item #13 – Approve Reinhart Boerner Van Deuren s.c. Legal Agreement – discussion on the history with Reinhart Boerner and the Professional Services provided by the firm including the services related to the development of a new water supply.

Thursday, January 17, 2008*Waukesha Water Commission*

Agenda Item #13 – Approve Professional Services Agreement for Radium Compliance Engineering Services – held pending a discussion with the DNR. Agenda Item #18 – Approve New Water Supply Development Contracts – discussion regarding the new water supply contracts with Martin Schreiber and Associates and GeoSyntec. The discussion included the topics of the Great Lakes Application, Public Outreach, the Conservation Plan, Educating the political area/region, advocacy of the Waukesha position, legislation to be introduced regarding the Great Lakes Compact and the return flow of wastewater to the Great Lakes basin.

Tuesday, January 13, 2008*Committee of the Whole/Waukesha Water Commission* **NO MINUTES**

Agenda Item #2 – Presentation by Peter Annin Author of *Great Lakes Water Wars* – Agenda Item #3 – Presentation by the Department of Natural Resources on the process for a Great Lakes water application. – discussion on the history of the Great Lakes and diversion applications as well as the impending Great Lakes Compact legislation. Agenda Item #3 – included a presentation by the DNR regarding the process that would be followed if the City of Waukesha applied for Great Lakes water. After both of these items, the common council, the water commission and the public were invited to questions related to the subject matter.

Wednesday, November 14, 2007*Waukesha Water Commission*

Agenda Item #5 CLOSED SESSION – PURSUANT TO SEC. 19.85(1)(e) and (g), WISCONSIN STATUTES, TO DISCUSS STRATEGY RELATIVE TO OUR LONG TERM WATER OPTIONS, AS WELL AS RADIUM COMPLIANCE, WITH LEGAL COUNSEL – no action taken. Agenda Item #6 – Approve 2008-2012 Five-Year Capital Improvement Plan Agenda Item #8 – Approve 2008 Budget – Agenda Items #6 and #8 included discussion regarding the significant budget items which included the Great Lakes application and associated projects. Agenda Item #11 – Approve Change Order #1 to Geosyntec Consultants Contract – discussion of Geosyntec's contract and their role with the Great Lakes application.

Wednesday, October 17, 2007*Waukesha Water Commission*

Agenda Item #15 – Discuss 2008-2012 Five-Year Capital Improvement Plan – Agenda Item #17 – Discuss 2008 Budget – Agenda Items #15 and #17 included discussion regarding the significant budget items which included the Great Lakes application and associated long-term water supply planning projects.

Thursday, September 20, 2007*Waukesha Water Commission*

Agenda Item #12 – Discuss Five-Year Capital Improvement Plan and Five-Year Financial Plan – discussion regarding the significant budget items which included the Great Lakes application and associated long-term water supply projects.

Wednesday, August 15, 2007*Waukesha Water Commission*

Agenda Item #11 – Discuss 2008-2012 Capital Improvement Plan – discussion regarding the significant budget items which included the Great Lakes application and associated future water supply projects.

Thursday, June 21, 2007

Waukesha Water Commission

Agenda Item #10 – Discuss Water Supply Status Report – discussion on the status of the existing wells and water supply facilities and the need for a new water supply updating the status of the search.

Thursday, April 19, 2007

Waukesha Water Commission

Agenda Item #15 – Approve Reinhart Boerner Professional Services Agreement – discussion on the history with Reinhart Boerner and the Professional Services provided by the firm including the services related to the development of a new water supply.

Thursday, January 18, 2007

Waukesha Water Commission

Agenda Item #7 – Approve New Water Supply Development Contracts – discussion regarding the new water supply contracts with Martin Schreiber and Associates and GeoSyntec. The discussion included the topics of the Great Lakes Application, Public Outreach, Development of the Conservation Plan, access to the Legislators and assistance with Lobbying and Public Relations.

Thursday, December 14, 2006

Waukesha Water Commission

Agenda Item #5 – Approve 2007-2011 5-Year Capital Improvement Plan Agenda Item #7 – Approve 2007 Budget Agenda Item – Agenda Items #5 and #7 – discussion regarding the significant budget items which included the Great Lakes Application and associated projects. Agenda Item #10 – Approve Right of Entry Agreement with Fiduciary Real Estate Development, Inc. – discussion regarding access to the Lathers parcel for geophysical testing on the Lathers site to determine the potential for new shallow wells.

Friday, November 17, 2006

Waukesha Water Commission

Agenda Item #10 – Approve Legal Services Agreement with Reinhart, Boerner, Van Deuren, Norris and Rieselbach, SC – discussion on the history with Reinhart Boerner and the Professional Services provided by the firm related to the development of a new water supply. Agenda Item #14 – Approve 2007-2011 5-Year Capital Improvement Plan Agenda Item #16 – Approve 2007 Budget – Agenda Items #14 and #16 included discussion regarding the significant budget items which included the Great Lakes application and water supply planning associated projects.

Friday, November 17, 2006

Waukesha Water Commission

Agenda Item #21 – Discuss Water Utility Information/Public Communication – discussion regarding communication with the public regarding the radium compliance issue, water conservation and the future water supply information. The discussion included the availability of water commissioners to the public, use of the city web site to disseminate information and the efficient use of bill stuffers and mailings to inform the public.

Thursday, November 9, 2006*Common Council*

Agenda Item #VI. A.—Presentation by the Water Utility regarding the history of Future Water Supply Options—This item included a presentation by the water utility general manager talking about the future water supply study and how it ties to radium compliance and the development of a new water supply for the City.

Friday, October 20, 2006*Waukesha Water Commission*

Agenda Item #3—Approve Offer to Purchase for the Engler Well Site—discussion regarding the purchase of the Engler site to develop a new shallow well no. 13. Agenda Item #8—Approve Southeastern Wisconsin Regional Planning Commission (SEWRPC) Agreement for Modeling the Troy Bedrock Valley—discussion of and agreement with SEWRPC and several other communities to develop a model to predict the impacts of installing additional high capacity shallow wells within the Troy Bedrock Valley. Agenda Item #10—Discuss 2007-2011 5-Year Capital Improvement Plan Agenda Item #12—Discuss 2007 Budget—Agenda Items #10 and #12 included discussion regarding the significant budget items which included the Great Lakes Application and associated projects to evaluate alternative water supplies.

Friday, September 15, 2006*Waukesha Water Commission*

Agenda Item #6—Discuss 5-Year Capital Improvement Plan and 5-Year Financial Plan—discussion regarding the significant budget items which included the Great Lakes application and associated long-term planning projects.

Friday, August 25, 2006*Waukesha Water Commission*

Agenda Item #12—2007-2011 Capital Improvement Plan—discussion regarding the significant budget items which included the Great Lakes application and associated projects. Agenda Item #14—Discuss Appointment to the Legislative Council on the Great Lakes Water Resources Compact—discussion regarding the general manager's appointment to the Legislative Council on the Great Lakes Water Resources Compact, the goals of that committee and how it was directly related to the potential application for Great Lakes water.

Friday, July 21, 2006*Waukesha Water Commission*

Agenda Item #11—Discuss Radium Compliance Strategy—discussion regarding development of a radium compliance strategy. This discussion included the following topics: the potential Lathers annexation; well no. 10 radium removal project; long term water supply development; Water Resources Development Act (WRDA) and the Great Lakes Compact; environmental issue associated with the development of a new water supply; return flow component related to a Great Lakes supply; and funding efforts.

Tuesday, May 16, 2006*Waukesha Water Commission*

Agenda Item #10—Approve Contract Amendment with Godfrey and Kahn, S.C.—discussion of a legal contract with Godfrey and Kahn for review of the current laws regarding the use of Great Lakes water as a water source.

Thursday, April 13, 2006

Waukesha Water Commission

Agenda Item #10 – Discuss Water Supply Status Report – discussion regarding the status of the existing wells, water supply facilities and the need for a new water supply updating the status of the search.

Thursday, March 16, 2006

Waukesha Water Commission

Agenda Item #14 – Ratify Godfrey and Kahn Change Order No. 1 – discussion of a legal contract with Godfrey and Kahn for review of the current laws regarding the use of Great Lakes water as a water source.

Thursday, February 16, 2006

Waukesha Water Commission

Agenda Item #15 – Approve Legal Services Contract – discussion of a legal contract with Godfrey and Kahn for review of the current laws regarding the use of Great Lakes water as a water source.

January 12, 2011

Sharon L. Leair, Chairman
Town of Genesee
S42 W31258 North Street
Genesee Depot, WI 53127

Subject: Request for Approval by the Town of Genesee of the City of Waukesha Water
Supply Service Area Plan

Dear Ms Leair:

The purpose of this letter is to request review and approval by the Town of Genesee of the City of Waukesha Water Supply Service Area Plan as discussed below.

Background and Regulatory Requirement

In December 2008, the Southeast Regional Planning Commission (SEWRPC), in conjunction with the Wisconsin Department of Natural Resources, delineated the water supply service area for the City of Waukesha which included an area of the Town of Genesee. (Refer to Attachment 1.) This planning guidance was prepared in a manner consistent with the Waukesha County comprehensive plan, the *Regional Water Supply Plan for Southeastern Wisconsin*, and state planning requirements. The proposed water supply service area and population projections are a basis for the *Draft City of Waukesha Water Supply Service Area Plan, April 2010*. (Refer to Attachment 2.) This proposed water supply service area is consistent with the current sewer system services area that has been approved by the Town of Genesee.

The City of Waukesha is making application for a diversion of Great Lakes water pursuant to Sections 281.346 and 281.348 Wis. Stats. The Great Lakes-Water Resources Compact and the Wisconsin Statutes adopted pursuant to the Compact require that the City document the public participation process conducted for the proposed Water Supply Area Plan, including evidence that the governing body of the Town of Genesee addressed by the plan have approved the Water Supply Service Area Plan, hence this request to the Town of Genesee.

The Town of Genesee water supply is currently provided by private wells. The future decision of whether to develop a Town municipal water supply system is up to the Town of Genesee. Municipal Great Lakes water supply would only be provided if needed and requested by the Town of Genesee. The Town was included by SEWRPC in the City of Waukesha's future water supply service area because it may be served by municipal water service during the planning horizon that extends to year 2035. Approval of the City's Water Supply Service Area Plan does not financially or legally commit the Town to actual Great Lakes water supply but rather acknowledges the potential for Great Lakes Water supply of the designated area of the Town by

the City sometime in the future. The Town will remain on its supply of private wells unless there is a water supply need and an initiative by the Town requesting Great Lakes water supply by the City for the designated service area. Non-approval by the Town of the City's Great Lakes water supply for the area of the Town designated by SEWRPC will result in this area being deleted from Great Lakes Water Supply Service by the City of Waukesha and revision of the Water Supply Service Area Plan. Approval of the City of Waukesha Water Supply Service Area Plan provides the Town with a contingency plan (Attachment 3) for water supply in the future if the Town ever decides to replace its private wells with a municipal supply.

Because our application for a Great Lakes water supply (Attachment 4) is currently pending before the DNR, we would appreciate a response by March 14, 2011. I would be happy to discuss this matter with you at your convenience. Thank you for your consideration.

Sincerely,

Waukesha Water Utility



Daniel S. Duchniak, P.E.
General Manager

Cc: Mike Hahn, Southeastern Wisconsin Regional Planning Commission
Dale Shaver, Waukesha County
Dino Tsoris, Wisconsin Department of Natural Resources
Jeff Scrima, City of Waukesha Mayor
Curt Meitz, City of Waukesha Attorney

Attachments

- 1- Southeastern Wisconsin Regional Planning Commission Letter, December 23, 2008
- 2- Southeastern Wisconsin Regional Planning Commission Letter, March 17, 2009
- 3- Draft City of Waukesha Water Supply Service Area Plan, April 2010
- 4- Application for Great Lakes Water Supply, May 2010 (3 copies)

**TOWN OF GENESEE
S43 W31391 HIGHWAY 83
PO BOX 242
GENESEE DEPOT, WI 53127
262-968-3656**

**REGULAR TOWN BOARD MEETING
FEBRUARY 14, 2011
7:00 P.M.
AGENDA**

1. Discussion/action – Minutes to be approved – Regular Town Board Meeting of 1-10-11; Special Town Board Meeting of 1-17-11
2. Monthly report from Wales-Genesee Fire Chief Greg Jezak
3. Discussion/action – Funding for Computerized Aided Dispatch (CAD) – Waukesha County Emergency Preparedness Department
4. Discussion/action – Contribution of one half of 5% matching 2010 Assistance to Firefighters Grant for the purchase of defibrillator
5. Discussion/action – Request for approval of the City of Waukesha Water Supply Service Area Plan
6. Discussion/action - Approval of Agreement/contract for computerizing building footprint information – Schultz Appraisal Agency
7. Discussion/action – Request for parking on town road and outside amplified music for wedding/reception at W330 S3388 Bryn Mawr Road – Wayne & Kathy Grandy
8. Discussion/action – Request for second access – Dan Kopshinsky, W289 S4685 Rockwood Trail
9. Discussion/action – Snow removal complaint – Jim Stresing - Jenkins Court
10. Discussion/action – Appointment as Recycling Coordinator – Marcia Bufton
11. Discussion/action – Approval of Resolution Authorizing the Recycling Coordinator with the DNR
12. Discussion/action – Request for final payment (Holiday Road project) – Mann Bros., Inc.
13. Discussion of financial guarantee for ditch and driveway bond (repeal of Ord. 03-1)
14. Discussion/action – Ordinance 11-1 to Repeal prior ordinances regarding culvert installation and fees , and to establish regulations regarding Town of Genesee public right-of-ways, including culvert regulations and driveway regulations
15. Reports –
 - A. Treasurer – Carol McCormick
 - a. 2010 tax collection
 - B. Public Works Supervisors – Tom Earle
 - a. Snow & Ice control update
 - b. Update on underground tank removal on Old Village Road
16. Discussion/action – Bills to be presented
17. Discussion/action –Approval of Resolution Designating Public Depository & Authorizing Withdrawal of County, City, Village Town or School District Moneys – Citizens Bank of Mukwonago
18. Discussion/action – Garbage/recycling billing for non-residents on Billings Court
19. Discussion/action – Upgrading of computer
20. Discussion/action – Request for Operator Permit
21. Reports –
 - A. Chairman – Sharon Leair
 - a. Update from WTA – Waukesha County Unit meeting of 1-26-11
 - b. Update regarding the Zurawski matter
 - c. Update on Town Zoning Code Meetings
 - B. Supervisor – Drake Reid
 - a. Update from Waukesha County Cooperation Council Meeting – 2-7-11

22. Correspondence

23. Adjourn

Barbara A. Whitmore, WCMC

Town Clerk/Designated Representative

February 10, 2011

Notice - It is possible that members of and possibly a quorum of members of other governmental bodies of the municipality may be in attendance at the above stated meeting to gather information; no action will be taken by any governmental body at the above stated meeting other than the governmental body specifically referred to above in this notice.

Please note that upon reasonable notice, efforts will be made to accommodate the needs of disabled individuals through appropriate aids and services. For additional information or to request this service, contact the Town Office at 968-3656.

**REGULAR TOWN BOARD MEETING
FEBRUARY 14, 2011**

Chairman Leair called the meeting to order at 7:02 p.m. Present were Supervisors Reid, Ross, Morris and Schmittinger. Also present were Planner Herrmann and Clerk Whitmore.

Discussion/action – Minutes to be approved –

Regular Town Board Meeting of 1-10-11 Morris made motion to approve the minutes of 1-10-11, Reid seconded, motion carried with Ross abstaining; **Special Town Board Meeting of 1-17-11** Reid made motion to approve, Schmittinger seconded, motion carried with Morris and Ross abstaining.

Monthly report from Wales-Genesee Fire Chief Greg Jezak

Board members will be copied with the monthly report. There were a total of 18 calls in January.

Discussion/action – Funding for Computerized Aided Dispatch (CAD) – Waukesha County Emergency Preparedness Department

Leair reported the Village of Wales has approved splitting this cost, discussion. Reid made motion to approve the town pay 1/2 of the \$1,175.00 for the Wales-Genesee Fire Department share of the CAD through the Waukesha County Department of Emergency Preparedness, Morris seconded, motion carried unanimously. The check is to be made to the Wales-Genesee Fire Dept.

Discussion/action – Contribution of one half of 5% matching 2010 Assistance to Firefighters Grant for the purchase of defibrillator

Jezak wrote a grant application in 2010 to replace two defibrillators for \$56,000; the federal government awarded the grant but only enough for one defibrillator, after pleading his case and they did award \$42,000 for both with a 95/5 percent split, the 5 percent for the fire department came to \$2,100, Genesee's portion will be \$1,050.00. The next grant he will work on will be towards radios. Morris made motion to approve the towns portion for the defibrillators, Ross seconded. Morris thanked the Chief for his diligence to get the grant. Motion carried unanimously.

Jezak reported the ad for engine 3761 has had several inquiries and bids; the bids close at 10 am tomorrow and hopefully the joint fire board will award to highest bidder tomorrow evening at the monthly board meeting. There have been inquires from Wisconsin, Wyoming and Texas.

Discussion/action – Request for approval of the City of Waukesha Water Supply Service Area Plan

Daniel Duchniak, general manager of the City of Waukesha Water Utility appeared to go over the city's request for approval of the City of Waukesha Water Supply Service Area Plan. SEWRPC had put about four square miles of the Town of Genesee on the map of possible future service area at the request of the DNR. The DNR had asked to include 17 areas in Waukesha County in the request service area looking at the information they have. They requested those areas be put in the requested service area in the event service may someday be needed. If the town signs on now they would only need to make a request to the City of Waukesha for service. If they do not sign on now they would have to work through the eight great lake states if service was requested later. Schmittinger asked if we would help pay for the city's request. Mr. Duchniak stated only if and when the town requested service. Schmittinger asked if we could get that in writing. Mr. Duchniak said he would send something to the town.

If the town does request to become part of the service plan it does not preclude the town from drilling their own well and starting their own utility district.

Mr. Duchniak told the Board he needs to hear from them by March 14th, since the next meeting is on the 14th, the morning of the 15th would be alright. This item was tabled to March.

Discussion/action - Approval of Agreement/contract for computerizing building footprint information – Schultz Appraisal Agency

Discussion, Schmittinger made motion to table, Morris seconded, motion carried unanimously.

Discussion/action – Request for parking on town road and outside amplified music for wedding/reception at W330 S3388 Bryn Mawr Road – Wayne & Kathy Grandy

This request is for Saturday August 27th. The Grandys and their nephew Brian were present to discuss the request. They will have the wedding, dinner and reception with amplified music in a large tent in their yard which is surrounded by trees. They expect 125 guests, parking would be allowed on one side of the road, leaving the driveway clear for emergency vehicles. They will be renting portable toilet facilities. The dinner will be from 5 to 7 pm and 8 to midnight a music reception; they have already spoken to several neighbors.

The Board suggested the contact the sheriff department, fire department and neighbors. Morris made motion to approve with music no later than midnight, Ross seconded, motion carried unanimously.

Discussion/action – Request for second access – Dan Kopshinsky, W289 S4685 Rockwood Trail

The Kosphinskys asked this be tabled to next month. Leair asked the Board to go and look at the Kopshinsky property; they will mark with a stake where they would like the second access to be. Schmittinger made motion to table, Reid seconded, motion carried unanimously.

Discussion/action – Snow removal complaint – Jim Stresing - Jenkins Court

Mr. Stresing was unable to make tonight's meeting and asked this be tabled to next month. Ross made motion to table, Schmittinger seconded, motion carried unanimously.

Discussion/action – Appointment as Recycling Coordinator – Marcia Bufton

Leair recommended appointing Marcia Bufton as our Recycling Coordinator, replacing Russ Evans who resigned as of December 31st. Ross made motion to appoint Marcia Bufton as the town's Recycling Coordinator, Schmittinger seconded, motion carried unanimously.

Discussion/action – Approval of Resolution Authorizing the Recycling Coordinator with the DNR

Discussion, Morris made motion to approve the Resolution Authorizing the Recycling Coordinator with the DNR, Schmittinger seconded, and motion carried unanimously.

Discussion/action – Request for final payment (Holiday Road project) – Mann Bros., Inc.

Discussion of the request for payment, and issue Tom has with the drainage of one driveway. We will not know if the ponding of water will be corrected until after the snow melts.

Morris made motion not to pay this bill per Tom's report one driveway does not met with standards, to check with Yaggy Colby to clarify the amount of the request and if there is proof the drainage will function. Schmittinger seconded, motion carried unanimously.

Discussion of financial guarantee for ditch and driveway bond (repeal of Ord. 03-1)

Herrmann discussed this with Attorney Macy this afternoon and felt we should leave this ordinance as is, we can handle the dollar amount of the bond through the fee schedule resolution.

Discussion/action – Ordinance 11-1 to Repeal prior ordinances regarding culvert installation and fees, and to establish regulations regarding Town of Genesee public right-of-ways, including culvert regulations and driveway regulations

The main change on this ordinance was the restriction of anything placed or planted in the right of way is prohibited; the other changes were basically removing the Town Engineer inspecting and changing it to the Public Works Supervisor; also the addition of section IV, mailbox regulations.

Ross made motion to approve Ordinance 11-1, Morris seconded, motion carried unanimously.

Discussion of policy for culvert inspections and fee.

Reports –

Treasurer – Carol McCormick

2010 tax collection

McCormick stated she has finalized tax collections, residents also asked when the house signs will be installed.

Bills to be presented

Schmittinger made motion to approve the bills as presented and to also approve two checks to the Wales-Genesee Fire Department for \$587.50 and \$1050.00. Morris seconded, motion carried unanimously.

Public Works Supervisors – Tom Earle

Snow & Ice control update

The blizzard plowing went well, drifting was a big issue; we did need to bring in a front end loader to clear some of the cul-de-sac's. All roads were open Wednesday before noon, widening and clean up took place Wednesday afternoon and Thursday. Eleven cars were abandoned on the town roads.

Discussion of Tom taking the town truck home to save him time coming back to the town and trouble getting to the garage at the park when large snow storms are predicted.

Update on underground tank removal on Old Village Road

The material is ready to be removed as soon as it thaws; the barrels should be picked up this week.

Update regarding the Zurawski matter

The building is gone, Mr. Zurawski hired a company to remove the building, some additional fill will be needed, there is a slight depression where the house was. They had requested to grade material from the property and were advised not to as this could change the drainage pattern of the property.

Leair added the attorney may be going back to court to try and re-coup some of our costs.

Discussion/action –Approval of Resolution Designating Public Depository & Authorizing Withdrawal of County, City, Village Town or School District Moneys – Citizens Bank of Mukwonago

Whitmore stated this is a request of the bank to have the form updated; it has to do with homeland security. Morris made motion to approve, Ross seconded, motion carried unanimously.

Discussion/action – Garbage/recycling billing for non-residents on Billings Court

It was discovered four residents on Billings Court are not being billed for garbage pickup, however Johns has them on the list they provided the town of addresses they pick up at. After further research it was found the properties are in both the town of Genesee and Ottawa. The residence is in Ottawa with the access in Genesee.

Discussion. Ross made motion a letter should be sent to the four home owners that the John's will be notified to stop pick up this week and to call John's to cancel the pickup. Schmittinger seconded, motion carried unanimously.

Discussion/action – Upgrading of computer

Herrmann explained the scanner for the new copier will not work with the current server we have, the company will not hook it up as they are afraid it will cause the server to crash. After discussion with Mike Rotroff it was felt the best way to solve this would be to replace a current computer and use the old one for the scanner only. We had not planned on replacing any computers until next year, but did budget funds this year in case there were any problems. This was discussed with the representative from the copier company prior to our signing the contract and they assured us there would be no problems. Discussion, it was agreed to replace Carol's computer, that no action was needed since there were budgeted funds.

Discussion/action – Request for Operator Permit

Ross made motion to approve the new application for Emma Rose Starzewski at Ten Chimneys Foundation subject to proof of schooling, Schmittinger seconded, motion carried unanimously.

Reports –

Chairman – Sharon Leair

Update from WTA – Waukesha County Unit meeting of 1-26-11

Chris Kapenga was present at the meeting and went over some of the budget issues being discussed. The wind turbine was also discussed.

Update on Town Zoning Code Meetings

The meetings are moving along, the Town of Vernon is planning on their public hearing the end of February.

Supervisor – Drake Reid

Update from Waukesha County Cooperation Council Meeting – 2-7-11

Reid said the minutes pretty much summarize what happened at the meeting.

There was also discussion on a new prescription drug discount card being offered to anyone in the county.

Correspondence

Board members were copied with correspondence.

There will be a public information meeting at the Mukwonago Village Hall on Tuesday February 22 from 5 to 7 pm regarding the highway 83 reconstruction from CTH "NN" to STH "59".

Schmittinger made motion to adjourn, Ross seconded, motion carried unanimously. Meeting adjourned at 8:50 p.m.

Respectfully submitted,

Barbara A. Whitmore, WCMC
Town Clerk



Waukesha Water Utility

SERVING WAUKESHA SINCE 1886

115 DELAFIELD STREET
WAUKESHA, WI 53188-3615

Telephone: (262) 521-5272 • Fax: (262) 521-5265 • E-mail: contactus@waukesha-water.com

February 16, 2011

Sharon L. Leair, Chairman
Town of Genesee
542 W31258 North Street
Genesee Depot, WI 53127

Subject: Request for Approval by the Town of Genesee of the City of Waukesha Water Supply Service Area Plan

Dear Ms Leair:

Thank you and the Town Board for their time in taking up the Approval of the Water Supply Service Area Plan at your meeting on Monday, February 14, 2011. I appreciate the board's thorough review of the request.

At the meeting, a question was asked related to the financial impact to the Town of Genesee if it was to approve the plan. This letter is to inform you that there are no costs associated with the inclusion of the proposed area within the Town of Genesee into the Water Supply Service Area plan and there are no costs associated with the application for Great Lakes water. The only costs that would be borne by the Town of Genesee would be those costs associated with the development of a water utility by the Town and the construction of facilities necessary to transfer the water from the Waukesha Water utility to the residents within the service area if the Town would choose to provide water service to its residents. Approval of the plan simply gives the Town the option to provide Great Lakes water in the future, not any obligation. Service would only be developed at the request of the Town of Genesee.

I trust this answers the questions raised at the meeting. Feel free to contact me at (262) 521-5272 ext. 518 if you have any further questions.

Thank you in advance for your attention to this matter.

Sincerely,

Waukesha Water Utility

Daniel S. Duchniak, P.E.
General Manager

NEWS ITEM

**TOWN OF GENESEE
S43 W31391 HIGHWAY 83
P.O. BOX 242
GENESEE DEPOT, WI 53127
262-968-3656**

REGULAR TOWN BOARD MEETING

MARCH 14, 2011

7:00 P.M.

AGENDA

1. Discussion/action – Awarding of Roadside Weed Cutting bid
2. Discussion/action – Minutes to be approved – Special Town Board Meeting of 2-11-11; Regular Town Board Meeting of 2-14-11; Executive Session of 2-18-11
3. Monthly report from Wales-Genesee Fire Chief Greg Jezak
4. Discussion/action – Request for approval of the City of Waukesha Water Supply Service Area Plan
5. Discussion/action – Approval of Agreement/contract for computerizing building footprint information – Schultz Appraisal Agency
6. Discussion/action – Request for second access – Dan Kopshinsky, W289 S4685 Rockwood Trail
7. Discussion/action – Snow removal complaint – Jim Stressing, Jenkins Ct.
8. Discussion/action – Request for Temporary Class "B"/"Class B" Retailers License – Genesee Rebels
9. Reports –
 - A. Treasurer – Carol McCormick
 - a. Update on 2010 tax collection
 - b. Update on 2009 & 2010 unpaid personal property taxes
 - B. Public Works Supervisor – Tom Earle
 - a. Update on snow and ice control
 - b. Update on road work
10. Discussion/action – Bills to be presented
11. Discussion/action – 2009 personal property taxes for Arnolds Environmental
12. Discussion/action – Ordinance 11-2, Ordinance to amend ordinance 11-1 culvert installation and fees, public right-of-ways, culvert regulations, driveway regulations and mailboxes
13. Discussion/action – Resolution 11-3R, Fee Schedule
14. Discussion/action – 2010 Budget Amendments
15. Discussion/action – Codification contract
16. Discussion – set date for 2011/12 Liquor License Hearing
17. Discussion/action – Operators' Permit applications
18. Reports –
 - A. Chairman – Sharon Leair
 - a. Proposed State Budget
 - b. Update on Zoning Code
 - c. Update on Zurwaski property
 - B. Clerk – Barb Whitmore
 - a. Update on garbage billing on Billings Ct.
19. Correspondence
20. Adjourn

Barbara A. Whitmore, WCMC
Town Clerk/Designated Representative
March 10, 2011

Notice - It is possible that members of and possibly a quorum of members of other governmental bodies of the municipality may be in attendance at the above stated meeting to gather information; no action will be taken by any governmental body at the above stated meeting other than the governmental body specifically referred to above in this notice.

Please note that upon reasonable notice, efforts will be made to accommodate the needs of disabled individuals through appropriate aids and services. For additional information or to request this service, contact the Town Office at 968-3656.

TOWN OF GENESEE
MARCH 14, 2011

Chairman Leair called the meeting to order at 7:02 p.m. Present were Supervisors Reid, Schmittinger and Ross; Morris was absent. Also present were Public Works Supervisor Earl and Clerk Whitmore.

Discussion/action – Awarding of Roadside Weed Cutting bid

Earle went over the two bids received and opened on March 11th at 3 pm. The two bids received were:

Watertown Evergreen - \$48.00 per hour, base bid

Butterfield Trucking - \$46.00 per hour, base bid

Earle taking the base bid and the additional three pieces of equipment listed on each bid figured the rate per hour per foot mowed which came to \$4.00 per foot per hour for the Butterfield bid and \$3.94 per foot per hour for the Watertown Evergreen bid.

Earle explained this was not an easy recommendation to make, Watertown was awarded the bid last year and did a good job, with no major complaints. Earle recommended Watertown Evergreen based on the numbers.

Discussion of the way the bid was written and equipment on each bid.

Ross made motion to go with the bid from Mr. Butterfield, his bid is the lower rate per hour based on the bid specs.

Paul Dishneau of Watertown Evergreen stated he uses a mower that is made specifically for hillside mowing, discussion.

Ross stated the base bid requested an hourly rate that is what we have to look at. Leair stated the bid specs will be reviewed and possibly changed before next year.

Schmittinger seconded the motion, motion carried unanimously.

Discussion/action – Minutes to be approved –

Special Town Board Meeting of 2-11-11 Ross made motion to approve, Schmittinger seconded, motion carried unanimously **Regular Town Board Meeting of 2-14-11** Ross made motion to approve, Schmittinger seconded, motion carried unanimously. **Executive Session of 2-18-11** Ross made motion to adjourn, Schmittinger seconded, motion carried unanimously.

Monthly report from Wales-Genesee Fire Chief Greg Jezak

Board members were copied with the monthly report; there were 23 calls in the month of February with a total of 53 calls as of this evening.

Engine 3761 was sold to the department in Couderay for \$15,000. There are currently three people in fire school, one in EMT and 1 in EMT IV tech.

Discussion/action – Request for approval of the City of Waukesha Water Supply Service Area Plan

A letter was received from Daniel Duchniak of the Waukesha Water Utility as requested at the February meeting stating there would be no cost to the town by approving the service area; the only cost to the town would be if the town decided to request service at a later date, by this approval the town would not have to work through the eight Great Lakes states if they did request service, discussion. Ross made motion to approve the request for participation in the City of Waukesha Supply Service Area Plan, Schmittinger seconded, motion carried unanimously.

Discussion/action – Approval of Agreement/contract for computerizing building footprint information – Schultz Appraisal Agency

Ross stated according to the minutes of the December 2010 meeting the Board already told the Schultz agency to start the project in 2011. He contacted the Town of Delafield which uses Schultz and they were charged the \$5 and \$10 fee; Town of Merton pays \$31,000 to maintain their records and is starting a reval at over \$200,000 which will include the additional drawings. The Town of Vernon has not been approached and he is waiting for a call back from the Town of Mukwonago. Barb contact the Town of Ottawa, theirs was done last year as part of their revaluation; Wales is doing a revaluation this year and this is part of the total package there was no break down; North Prairie has heard nothing about this. Discussion. Ross made motion to approve the agreement as provided, Schmittinger seconded, motion carried unanimously.

Discussion/action – Request for second access – Dan Kopshinsky, W289 S4685 Rockwood Trail

Discussion of the proposal, Leair was concerned about the drop off and utilities. Mr. Kopshinsky felt this was the best area, there would be few trees to remove, they will have to purchase some land from their neighbor to make the access. Ideally they would like them to come in one side and go out the other, backing out is the real danger. There was also a discussion on the purchase of land from the neighbor and if they will be creating a non-conforming lot. Ross made motion to approve the second access subject to their not creating a non-conforming lot and subject to the Mr. Kopshinsky acquiring the land. Schmittinger seconded, motion carried unanimously. Per Tom Earle a culvert will not be required.

Discussion/action – Snow removal complaint – Jim Stressing, Jenkins Ct.

A letter of complaint and pictures were received by the town on February 7th from Jim Stressing on Jenkins Ct.

Mr. Stressing stated the town has a policy, why is it not followed. The entrance into his subdivision was barely 12 feet across 24 hours after the snow storm and the policy reads it will be 15 feet, regardless of the storm, that needs to be done.

Earle stated the main objective is to get the roads open, then do the clean up and widening of the roadway.

Discussion on how the cul-de-sac is plowed and how Mr. Stressing felt it should be done.

Leair told Mr. Stressing the Board had heard his complaints. Mr. Stressing asked if the town was going to follow your policy, as the policy needs to be followed. Schmittinger felt this was exceptional storm, with a large volume of snow and blizzard winds, if there is a problem call and we will respond accordingly. The town's first responsibility is to make the roads accessible for emergency equipment.

Discussion/action – Request for Temporary Class "B"/"Class B" Retailers License – Genesee Rebels

Discussion. Ross made motion to approve the license for the Genesee Rebels, the area is immediately surrounding the 3 ball diamonds, and the entire park is not under this license or reserved for the Rebels sales. 2011 regular season games, rain dates and post season games, also the Gibson Memorial Tournament. Schmittinger seconded, motion carried unanimously.

Reports –**Public Works Supervisor – Tom Earle****Update on snow and ice control**

The billing covered the blizzard in February; major equipment was used on many of the cul-de-sac to remove the large drifts, also the clear the parking lanes on highway 83. It was agreed Butterfield did a good job opening the roads.

Update on road work

Earle reported he attended a seminar by the DOT, the prevailing wage law may go away, if so it would be a substantial savings to the town, discussion.

Treasurer – Carol McCormickUpdate on 2010 tax collection

McCormick explained there error with the December 17th property bills caused by the payments for that date not being forwarded to the county; in February the county sent delinquent bills to those residents. A letter from McCormick was sent to the property owners explaining the error.

Update on 2009 & 2010 unpaid personal property taxes

The 2008 and 2009 unpaid personal property tax bills will be sent to the county for collection and charged back.

Discussion/action – 2009 personal property taxes for Arnolds Environmental

McCormick received a letter from Arnolds Environmental from August 2006 stating they file their personal property taxes in the Town of Saukville; she had sent them a letter that the bill for 2009 would be turned over to the county for collection; she was asking the Board to approve writing this off and charging it back, discussion. Schmittinger made motion to table this item that we need clarification what constitutes a business, Ross seconded, motion carried unanimously.

Discussion/action – Bills to be presented

Ross made motion to approve the bills as presented, including the invoice for \$62,513.75 from Butterfield, Reid seconded, motion carried unanimously.

Discussion/action – Ordinance 11-2, Ordinance to amend ordinance 11-1 culvert installation and fees, public right-of-ways, culvert regulations, driveway regulations and mailboxes

Discussion, Board members agreed to add “or cash equivalent of a standard post and box or as determined by the town” to section IV Mailbox Regulations. Ross made motion to approve Ordinance 11-2 subject to the change discussed, Schmittinger seconded, motion carried unanimously.

STATE OF WISCONSIN

TOWN OF GENESEE

WAUKESHA COUNTY

ORDINANCE NO. 11-2

AN ORDINANCE TO AMEND ORDINANCE NO. 11-1
CULVERT INSTALLATION AND FEES, PUBLIC RIGHT-OF-WAYS, CULVERT REGULATIONS,
DRIVEWAY REGULATIONS AND MAILBOXES

WHEREAS, the Town Board of the Town of Genesee adopted an Ordinance to regulate culvert installation and fees, public right-of-ways, culvert regulations, driveway regulations and mailboxes in the Town of Genesee; and

WHEREAS, the Town Board of the Town of Genesee finds that it is reasonable to amend the Ordinance to better serve the taxpayers of the Town,

NOW, THEREFORE, the Town Board of the Town of Genesee, Waukesha County, Wisconsin, DOES ORDAIN AS FOLLOWS:

SECTION 1: Town of Genesee Ordinance No. 11-1 entitled an ordinance to repeal prior ordinances regarding culvert installation and fees, and to establish regulations regarding Town of Genesee public right-of-ways, including culvert regulations and driveway regulations, Section IV Mailbox Regulations, Subsection C, is hereby repealed and recreated to read as follows:

IV. MAILBOX REGULATIONS

C. The Town shall not replace any mailbox in kind. Should an investigation determine that a mailbox was damaged by Town or Contractor equipment, the property owner shall receive a standard (4 in. x 4 in.) post and box unit or the cash equivalent of a standard (4 in. x 4 in.) post and box unit as determined by the town. The post shall consist of either a treated or cedar material, depending on what was found in the investigation.

SECTION 2: SEVERABILITY.

The several sections of this ordinance are declared to be severable. If any section or portion thereof shall be declared by a court of competent jurisdiction to be invalid, unlawful or unenforceable, such decision shall apply only to the specific section or portion thereof directly specified in the decision, and shall not affect the validity of any other provisions, sections or portions thereof of the ordinance. The remainder of the ordinance shall remain in full force and effect. Any other ordinances whose terms are in conflict with the provisions of this ordinance are hereby repealed as to those terms that conflict.

SECTION 3: EFFECTIVE DATE

This ordinance shall take effect immediately upon passage and posting or publication as provided by law.

Dated this ____ day of _____, 2011.

TOWN OF GENESEE

ATTEST:

Sharon L. Leair, Town Chair

Barbara A. Whitmore, Town Clerk

Published and/or posted this ____ day of _____, 2011

Discussion/action – Resolution 11-3R, Fee Schedule

Whitmore went over the proposed changes – Planner from \$84.00 to \$87.50; Public Site Fees were changed as follows – single family unit \$844.00 to \$860.00, multi-family unit -\$553.00 to \$563.50 and studio/one bedroom \$421.00 to \$429.00. Occupancy Bond from \$1,900.00 to \$2,000.00. Voter Registration List and Satellite dish public hearing were both removed. Schmittinger made motion to approve Resolution 11-3R, Ross seconded, motion carried unanimously.

WAUKESHA COUNTY**TOWN OF GENESEE****STATE OF WISCONSIN****RESOLUTION 11-3R**

**A RESOLUTION
TO ADOPT THE CHARGES AND FEE SCHEDULE
FOR THE TOWN OF GENESEE**

BE IT RESOLVED BY THE Town Board of the Town of Genesee, Waukesha County, Wisconsin That certain fees described by ordinances of the Town of Genesee are hereby established in the amounts described herein:

Charges & Fees**Town Hall**

Hall rental	100.00
Security deposit	50.00

Dogs

Dog license	10.00	spayed/neutered
	15.00	male/female
	5.00	late fee-after March 31st
	25.00	plus license fees
Hobby kennel		PUBLIC HEARING
		Required
Commercial kennel	35.00	

Liquor Licenses

Operator's permits	25.00	1 year permit
Cigarette license	30.00	
Class "A" Beer	25.00	
Class "A" Liquor	325.00	
Class "B" Beer	100.00	
Class "B" Liquor	325.00	
"Class C" Wine	100.00	
Picnic & Wine	10.00	per day
Publication fee	25.00	must be paid at submittal

Certified Surveys/ Subdivisions

Clerical Fees	100.00	CSM
	200.00	Plat
Professional Fees		
Planner	85.70	per hour
Attorney	Time & Expense	
Engineer	Time & Expense	
Final Submittals - plats		
Public Site Fee	860.00	per single family unit
	563.50	per multi-family unit
	429.00	studio/1 bedroom
Clerical fee	75.00	
Professional fees	as above	
Re-submittals (plats & CSM)	75.00	per submittal
Occupancy Bond	2,000.00	
Culvert Application	110.00	
Cul de sac length	75.00	special exception

Holding Tank Permits

Residential	150.00	
Business - Holding tank	0.06	per gal
Grease tank	0.15	per gal

Solicitor/Peddlers Permit	35.00
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Miscellaneous

Copies - black/white	0.25	a copy
color	1.00	a copy
Special Assessment Letters	20.00	
	25.00	walk-in & Faxed
Town road map	2.00	plus tax .10
Land Division & Development	19.00	plus tax .97
Waukesha County zoning code	27.00	plus tax 1.38
Waukesha County Shoreland/Floodland	10.50	plus tax .54
Faxed copies	2.00	1 st Page
	1.00	add'l pages
Returned checks	30.00	

Park & Recreation Fees

Shelter House

Resident		125.00	plus tax 6.38
Non-resident		300.00	plus tax 15.30
Youth Sports			
Soccer/Ball		33.00	Child
		50.00	Late sign-up
Adult Leagues		50.00	a team
Field Rentals			
Practice time - town		15.00	per hour
	non-town	20.00	per hour
Game's - town		15.00	per hour plus field prep.
	non-town	20.00	per hours plus field prep.
Field Preparation		20.00	soccer
		30.00	ball
		50.00	hardball
<u>Tournaments</u>			
Town Leagues			
1 staff person		120.00	a day
additional staff		15.00	per hour
Diamond/Field use		10.00	per hour
Bond		350.00	
Dumpster Fee		280.00	
Shelter House Fees			
Town Park	per day	125.00	plus tax 6.38; 2 fields & 1 kitchen
Sunset Park	per day	250.00	plus tax 12.75; 4 fields & 2 kitchens
Non-Town Leagues			
1 staff person		150.00	a day
additional person		20.00	per hour
Diamond/Field use		15.00	per hour
Bond		500.00	
Dumpster fee		280.00	
Shelter House Fees			
Town Park	per day	300.00	plus tax 15.30; 2 fields & 1 kitchen
Sunset Park	per day	600.00	plus tax 30.60; 4 fields & 2 kitchens

This resolution shall take effect immediately upon passage and posting as provided by law.

Dated this _____ day of March 2011.

TOWN OF GENESEE

Sharon L. Leair, Chairman

ATTEST:

Discussion/action – 2010 Budget Amendments

Discussion of the changes, Whitmore said there will be an addition of \$293,000.00 to the general fund balance from the 2010 budget.

Schmittinger made motion to approve the 2010 Budget Amendments, Ross seconded – roll call vote – Ross, aye; Schmittinger, aye; Reid – aye; Leair- aye; motion carried unanimously.

**TOWN OF GENESEE
2010 Budget Amendment**

PLEASE TAKE NOTICE THAT the Town of Genesee Board at a Regular Town Board Meeting of March 14, 2011, amended the 2010 Budget. Said amendments were approved unanimously by a roll call vote.

General Fund	Budget		Proposed <u>Amendment</u>
	<u>Current</u>	<u>Amended</u>	
Expenditures			
General government:			
Town Board	46,850	47,800	950
Elections	16,293	15,554	(739)
Outside services	53,875	56,338	2,463
Public Safety			
Fire and rescue	334,584	643,910	309,326
Increase in expenditures			<u>312,000</u>
Other financing sources			
Proceeds of long term debt	-	312,000	<u>312,000</u>

Barbara A. Whitmore, WCMC
Town of Genesee Clerk

Discussion/action – Codification contract

Whitmore asked this be tabled; the bids have to be reviewed to be sure we are looking at the same costs from each vendor. Schmittinger made motion to table the Codification contract, Ross seconded, motion carried unanimously.

Discussion – set date for 2011/12 Liquor License Hearing

Discussion, the Liquor License Hearing will be held on June 13th at 6:30 p.m. before the Board Meeting.

Discussion/action – Operators' Permit applications

Ross made motion to approve the new application for James Kenneth Beier at Saxe's and a new application for Roberta R. Vande Leest for the Lions Club, Reid seconded, motion carried unanimously.

Reports –**Chairman – Sharon Leair****Proposed State Budget**

Leair went over the proposed cuts the town may face from shared revenue, general transportation and the recycling grant. Discussion.

Update on Zoning Code

The Chairman from the three towns will each contact several County Board representative to discuss our zoning issues and will invite them all to a meeting here on March 31st.

Update on Zurwaski property

We may need a closed session regarding this; our attorney is working on a compromise to recover the costs and fees the town is legally entitled to.

Clerk – Barb WhitmoreUpdate on garbage billing on Billings Ct.

Whitmore explained to the Board the garbage billing on Billings Court has been taken care of, the residents in the town of Ottawa that are receiving service from John's pay John's Disposal directly, a letter has been sent to those Ottawa residents with an apology. When John's was contacted about the addresses on the garbage list, they did not tell Whitmore that they contracted with John's directly.

Correspondence

Whitmore reported we received a thank you letter from the Mediation & Restorative Center for the \$250.00 donation. The final quarterly franchise fee from Time Warner was received February 22nd in the amount of \$12,923.43.

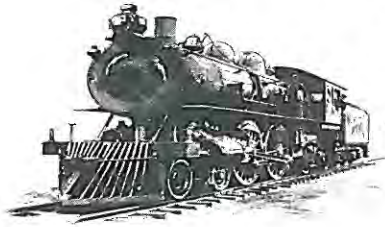
Schmittinger made motion to adjourn

Paul Dishneau of Watertown Evergreen came to the table to talk to the Board about the bid awarded this evening. Mr. Dishneau questioned the bidding by the hour this year and per the foot last year; also he owns the equipment listed on his bid, he said the spec sheet reads machinery you currently own. Discussion, Schmittinger stated this will be checked, we can revisit this after Tom checks out if Butterfield has the 3 pieces of equipment.

Ross seconded the motion to adjourn, Motion carried unanimously. Meeting adjourned at 8:50 p.m.

Respectfully submitted,

Barbara A. Whitmore, WCMC
Town Clerk



Town of Genesee est. 1843

S43 W31391 Hwy 83

PO Box 242

Genesee Depot, WI 53127-0242

Phone: 262-968-3656

www.towngenesee.org

March 15, 2011

RECEIVED

MAR 16 2011

Waukesha
Water Utility

Daniel Duchniak, P.E.
Waukesha Water Utility
115 Delafield Street
Waukesha, WI 53186-3615

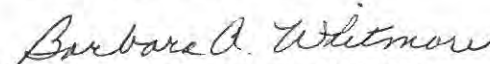
Re: Request for Approval by the Town of Genesee on the City of Waukesha Water Supply Service Area Plan

Dear Mr. Duchniak,

Please be advised the Genesee Town Board at their Regular Town Board Meeting of March 14, 2011, by a motion duly made and seconded, unanimously approved the request by the Waukesha Water Utility for participation in the City of Waukesha Water Supply Service Area Plan. This motion was made pursuant to your letter of February 16, 2011 stating there would be no financial impact on the Town of Genesee associated with the city's application for Great Lakes water. The only costs that would be borne by the town would be those costs associated with the development of a water utility by the Town and the facilities necessary to transfer the water from the Waukesha Water utility to the residents within the service area if the town would choose to provide a water service area to its residents. This approval does not obligate the town in the future unless the Town requested service in the future.

Sincerely,

TOWN OF GENESEE


Barbara A. Whitmore, WCMC
Town Clerk



Waukesha Water Utility

SERVING WAUKESHA SINCE 1886

115 DELAFIELD STREET
WAUKESHA, WI 53188-3615

Telephone: (262) 521-5272 • Fax: (262) 521-5265 • E-mail: contactus@waukesha-water.com

January 12, 2011

Ms Angie E. Van Scyoc
Town of Waukesha
S31W253 Glendale Road
Waukesha, WI 53189

Subject: Request for Approval by the Town of Waukesha of the City of Waukesha Water Supply Service Area Plan

Dear Ms Van Scyoc:

The purpose of this letter is to request review and approval by the Town of Waukesha of the City of Waukesha Water Supply Service Area Plan as discussed below.

Background and Regulatory Requirement

In December 2008, the Southeast Regional Planning Commission (SEWRPC), in conjunction with the Wisconsin Department of Natural Resources, delineated the water supply service area for the City of Waukesha which included an area of the Town of Waukesha. (Refer to Attachment 1.) This planning guidance was prepared in a manner consistent with the Waukesha County comprehensive plan, the *Regional Water Supply Plan for Southeastern Wisconsin*, and state planning requirements. The proposed water supply service area and population projections are a basis for the *Draft City of Waukesha Water Supply Service Area Plan, April 2010*. (Refer to Attachment 2.) This proposed water supply service area is consistent with the current sewer system services area that has been approved by the Town of Waukesha.

The City of Waukesha is making application for a diversion of Great Lakes water pursuant to Sections 281.346 and 281.348 Wis. Stats. The Great Lakes-Water Resources Compact and the Wisconsin Statutes adopted pursuant to the Compact require that the City document the public participation process conducted for the proposed Water Supply Area Plan, including evidence that the governing body of the Town of Waukesha addressed by the plan have approved the Water Supply Service Area Plan, hence this request to the Town of Waukesha.

The Town of Waukesha water supply is currently provided by private wells. The future decision of whether to develop a Town municipal water supply system is up to the Town of Waukesha. Municipal Great Lakes water supply would only be provided if needed and requested by the Town of Waukesha. The Town was included by SEWRPC in the City of Waukesha's future water supply service area because it may be served by municipal water service during the planning horizon that extends to year 2035. Approval of the City's Water Supply Service Area Plan does not financially or legally commit the Town to actual Great Lakes water supply but rather acknowledges the potential for Great Lakes Water supply of the

Ms Angie E. Van Scyoc
Page 2
January 10, 2011

designated area of the Town by the City sometime in the future. The Town will remain on its supply of private wells unless there is a water supply need and an initiative by the Town requesting Great Lakes water supply by the City for the designated service area. Non-approval by the Town of the City's Great Lakes water supply for the area of the Town designated by SEWRPC will result in this area being deleted from Great Lakes Water Supply Service by the City of Waukesha and revision of the Water Supply Service Area Plan. Approval of the City of Waukesha Water Supply Service Area Plan (Attachment 3) provides the Town with a contingency plan for water supply in the future if the Town ever decides to replace its private wells with a municipal supply.

Because our application for a Great Lakes water supply (Attachment 4) is currently pending before the DNR, we would appreciate a response by March 14, 2011. I would be happy to discuss this matter with you at your convenience. Thank you for your consideration.

Sincerely,

Waukesha Water Utility



Daniel S. Duchniak, P.E.
General Manager

Cc: Mike Hahn, Southeastern Wisconsin Regional Planning Commission
Dale Shaver, Waukesha County
Dino Tsoris, Wisconsin Department of Natural Resources
Jeff Scrima, City of Waukesha Mayor
Curt Meitz, City of Waukesha Attorney

Attachments

- 1- Southeastern Wisconsin Regional Planning Commission Letter, December 23, 2008
- 2- Southeastern Wisconsin Regional Planning Commission Letter, March 17, 2009
- 3- Draft City of Waukesha Water Supply Service Area Plan, April 2010
- 4- Application for Great Lakes Water Supply, May 2010 (3 copies)

AMENDED

AGENDA

Town of Waukesha **Town Board Meeting**
W250 S3567 Center Road, Waukesha, Wisconsin 53189
Thursday, March 24, beginning at 6:30 p.m.

1. **Call to Order and the Pledge of Allegiance**
2. **Proclamation** – Tabled from March 10, 2011 meeting
 - i. Honoring Eagle Scout Steven D. Novak
3. **Citizen Comments**
4. **Approval of Minutes**
 - a. March 8, 2010, Special Meeting
5. **NEW BUSINESS:** Discussion and Possible Action on the following:
 - a. **Waukesha Water Utility**
 - i. City of Waukesha Water Supply Service Area Plan
 - b. **Public Hearing** – *To invite public input on request of City of Waukesha to the Town of Waukesha that it support expansion of the City water service area to include various parts of the Town.*
6. **REPORTS**
 - a. None
7. **AUTHORIZE PAYMENT OF BILLS**
8. **You are hereby notified** that the Town Board of the Town of Waukesha will convene into closed session on Thursday, March 24, 2011 and upon motion duly made and seconded and acted upon by roll call vote as required under Wis. Stats. 19.85(1)(g). Town Board members and Town Attorney attend the closed session. The purpose of the closed session is as follows:

Conferring with legal counsel for the governmental body who is rendering oral or written advice concerning strategy to be adopted by the body with respect to litigation in which it is or is likely to become involved regarding the Jacobson snow plow contract.
9. **You are hereby notified** that the Town Board of the Town of Waukesha will convene on Thursday, March 24, 2011, at 6:30 p.m. and may upon motion duly made and seconded and acted upon by roll call vote as required under Wis. Stats. 19.85(1) (e) to go into closed session. Town Board members and Town Attorney and invited consultant(s) may attend the closed session. The purpose of the closed session is as follows:

Deliberating or negotiating the purchasing of public properties, the investing of public funds or conducting other specified public business, whenever competitive or bargaining reasons require a closed session. To consider negotiation alternatives in dealing with the City of Waukesha to preserve the integrity of the Town borders, including but not limited to a border agreement.
10. **If necessary**, reconvene into open session to discuss and take action relating to the subject of the closed meeting discussions.
11. **ADJOURNMENT**

NOTICE: IT IS POSSIBLE THAT MEMBERS OF AND POSSIBLY A QUORUM OF MEMBERS OF OTHER GOVERNMENTAL BODIES OF THE MUNICIPALITY MAY BE IN ATTENDANCE AT THE ABOVE-STATED MEETING AND GATHER INFORMATION; NO ACTION WILL BE TAKEN BY ANY GOVERNMENTAL BODY AT THE ABOVE-STATED MEETING OTHER THAN THE GOVERNMENTAL BODY SPECIFICALLY REFERRED TO ABOVE IN THIS NOTICE.

NOTE: Requests from persons with disabilities who need assistance to participate in this meeting or hearing should be made to the Town Clerk's office at 262.542.5030 with as much advance notice as possible.

*** Notice is hereby given that if you or your representative is not present at this meeting, the matter may be tabled or denied.**

Re-Posted/Re-Emailed: March 23, 2011

Uploaded to Website: www.townofwaukesha.us

AGENDA

Town of Waukesha Town Board Special Meeting
W250 S3567 Center Road, Waukesha, WI 53189
Tuesday, March 8, 2011 – 5:00 p.m.

1. Call to Order
2. You are hereby notified that the Town Board of the Town of Waukesha will convene on Tuesday, March 8, 2011 5:00 p.m. and may upon motion duly made and seconded and acted upon by roll call vote as required under Wis. Stats. 19.85(1) (e) go into closed session. Town Board members and Town Attorney and invited consultant(s) may attend the closed session. The purpose of the closed session is as follows:

Deliberating or negotiating the purchasing of public properties, the investing of public funds, or conducting other specified public business, whenever competitive or bargaining reasons require a closed session with respect to a water service area proposal.

3. If necessary, reconvene into open session to discuss and take action relating to the subject of the closed meeting discussions.
4. Adjournment

NOTE: Requests from persons with disabilities who need assistance to participate in this meeting or hearing should be made to the Town Clerk's Office at 262-542-5030 with as much advance notice as possible.

Emailed/Posted: March 7, 2011

Upload to Website: www.townofwaukesha.us

Attachment WS6

Public Meeting Comment Summary

Committee of the Whole
October 12, 2009
Questions/Answers

Question by:	Question	Answer
Paul Furrer	<ol style="list-style-type: none"> 1. How big is the water pipe for inflow/outflow—redundancy? 2. Will there be a redundancy on return flow? 	<ol style="list-style-type: none"> 1. Dan—Size of the pipe to supply the water has yet to be determined. Intent with regards to redundancy, is to continue to develop the shallow well fields we have and maintain the shallow wells that we have in our system, that would be as redundant back-up in peaking supplies so that would be available in the event of a catastrophic failure on the pipeline itself, that we would be able to turn on those wells, provide more water supply and fire protection to the residents of the City of Waukesha while that is being repaired. As far as the return flow pipeline, again that has not been sized as of yet. 2. Dan—There will not be a redundancy on the return flow. The back-up to that would be in the event of a catastrophic failure or something happening on that line, the discharge would be to the Fox River until the point in time that we repaired that pipeline and could send the water back.
Joan Francouer	<ol style="list-style-type: none"> 1. What is surface water features? 2. Timing of application coming from the City and when is the ideal time with regards to rules and regulations that individual states are drawing up? 	<ol style="list-style-type: none"> 1. Dan—Wetlands, rivers, streams, lakes are considered surface water features. 2. Mayor—The compact, when it passed the WI Legislature, had about 175 pages of implementing language. Our application will follow all of those details that are there. In our discussions with the DNR they've said that at some point they will be writing rules, but we do not need to wait to move forward with an application for those rules to be written. Dan—I participate on the Groundwater Advisory Committee and we recommended groundwater quantity legislation and as part of that—laws were passed and implemented and rules were not made, but that did not mean that people stopped applying for well permits throughout the state. The DNR, while we were in the process of developing rules, they still processed applications and approved high-capacity well permits for people that did apply. Mayor—Bottom line is we do not have the luxury of waiting because of the settlement with the Dept. of Justice on the radium compliance because we either have to be successful with the Great Lakes water application by the middle of 2018 or we have to move forward with our alternative. The first example of a community getting Great Lakes water, which is different than what our application is going to be, is New Berlin. They are a straddling community where half the community is in the basin and half is out. They

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Question by:	Question	Answer
		<p>had to get approval from WDNR, but did not have to go through the other 7 states. Their application had been approved even though the rules had not yet been written. Dan—The DNR is estimating about 4,000 hours that it would be required with regards to developing the rules. The first presentation I gave to this Council was in 2004 when we talked about a future water supply and the implementation of that water supply on the original timeline I had 2010 as the goal. 2010 is in a few months and we still haven't even started construction. As we move to implement this, it's going to take a number of years. We estimate about 5 years from starting to acquire the land through the easement acquisition process to actually constructing it and putting the infrastructure in place and then turning it on.</p>
Peggy Bull	1. Return Flow Options Costs—Difference between Underwood Creek and the Root River O/M costs.	1. Dan —Major difference is the distance it's going to have to move.
Emanuele Vitale	<p>1. What would happen if there was a pipe breakdown? Would we be able to use our current wells as back-up?</p> <p>2. Will WWU treat the water that comes from Lake Michigan?</p> <p>3. Will we have a chlorine taste in the water?</p> <p>4. WWU regarding Milwaukee concerns on cryptosporidium.</p> <p>5. Will Waukesha be at the mercy of Milwaukee as far as pricing and costs?</p>	<p>1. Dan—The intent would be to maintain the shallow aquifer wells (abandon the deep aquifer wells) and have those in operation for emergency and back-up redundancy.</p> <p>2. Dan—There will have to be some type of touch up treatment—mainly chlorine will be added to maintain the chlorine residual throughout our distribution system. No other treatment that would be necessary other than the wastewater treatment at the end of the process.</p> <p>3. Dan—Taste of chlorine means the chlorine is actually reacting with something that's in the pipes. As long as we flush and maintain our system, we shouldn't have that problem within the City of Waukesha. Well water retains a lower residual than on surface water.</p> <p>4. Dan—Since the outbreak ~10 years ago, it made an awareness of the water and provided the incentive for everyone to treat water to the fullest extent as possible. Milwaukee has installed an ozone system that does take care of the cryptosporidium issue and treats the water to a much higher level where they've been recognized on the world level of the high quality water they put out in their system. Relocated their intake out of the zone of influence where the discharges were that provided the contaminants into their influence</p>

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Question by:	Question	Answer
		<p>stream. They addressed the problem from the influence standpoint and from a treatment standpoint.</p> <p>5. Dan—The pricing and cost of water comes from the PSC and they do water cost studies that they have to approve. PSC does a cost of service analysis and they determine the water rates, the rate of return, and what they can charge you. PSC process will be on both the Milwaukee and Waukesha sides.</p>
Terry Thieme	<p>1. Preliminary cost projection—how will it affect each household in the City?</p> <p>2. Keep CC informed of costs.</p>	<p>1. Dan—We’re in the process of projecting out what the costs may or may not be. The Mayor, Water Utility Commission, and I are working heavily with the representatives in Washington to identify federal dollars that would be available to help assist us in our efforts to maintain the water and return it back to the Great Lakes. So far we’ve received just short of \$4 million from the federal gov’t with regards to radium compliance. Now we’re identifying other means that would bring in larger dollars to help offset those costs.</p> <p>Mayor—We’re hoping we might know something about federal dollars in February. Dan—Meeting with our consultants in Washington and in Wisconsin with regards to the funding effort and we’re identifying some programs. We’ll be meeting later this month to look at those programs and discuss with our representatives and we’re looking to go out to Washington in January to further those talks and, hopefully, get into some of those programs. We hope to have some of those answers prior to an application being made.</p>
Carrol Waldenberger	<p>1. Agreements for seeking water from municipalities—are there anticipated problems with return flow politically with communities? How is that being addressed?</p> <p>2. Provided you are getting approvals for Great Lakes water, when does Engineering start to get the water here and return the water?</p> <p>3. Are you trying to identify existing</p>	<p>1. Mayor –In terms of the process from other communities, the first step will be at the October 20th Council meeting to ask the Council to make the official request. If we’re successful in getting 3 letters of intent, we’ve been upfront that Milwaukee is our 1st choice both for financial, as well as regional cooperation reasons. There will have to be negotiations similar to what New Berlin did, which is an amount of money we would pay any community on an annual basis, as well as a possible sum to complete an application. Negotiating with any community has political issues. I don’t know if there are any political issues in terms of return flow, we’ve been working hard and that will be part of the application to detail explain how</p>

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Question by:	Question	Answer
	<p>corridors on getting the water here and returning it? A lot of potential for going over private property to get the water and get it back</p>	<p>the return flow will occur.</p> <p>2. Dan—We’ve also had meetings with the other communities that we’d be potentially returning the water and we have made them aware of potentially what our intent is. With regards to the engineering, it is a long drawn out process no matter which way we go, and once we receive approval for a Great Lakes application, then there’s going to be PSC/WDNR in our review of the project. Once we get the approval and once we know we’re going to move forward, the engineering will start.</p> <p>3. Dan—From a preliminary design perspective, we have done some preliminary investigations in regards to corridors that are available for installing a pipe, as is SEWRPC involved from their preliminary design water supply plan and there are corridors available for us to potentially take a pipeline down. We have talked to some people that are responsible for those corridors and there is interest there.</p>
Joe Pieper	<p>1. What is “old” water? Using deep wells now, are we running the risk of tapping into old water today?</p> <p>2. Annual O/M budget being that the Utility is going to be relying on existing systems for redundancy, will there be cost savings to the Utility if we go with Plan A or B or will the Utility simply have to maintain their existing systems at the same level as they are today in the event of an emergency?</p> <p>3. How do you pay for this? At the very end of the day once we have received any funding, the ultimate cost of this (Plan A or B) will be left to the City of Waukesha. Correct? The City/Common Council will be the ones approving the borrowing for these funds. Correct?</p>	<p>1. Jeff—Water that has been in the aquifer for hundreds if not thousands of years. Different from a shallow aquifer where it’s much more recent water that’s entered the system. Old water is just a term that it’s been in the ground for a long time. Only health concerns are if you go deeper into the ground. Dan—As we pull down further and further, the water gets older and that’s where you run into the salinity issues and the more brackish water issues.</p> <p>2. Dan—There is going to be cost savings when we abandon our deep aquifer wells and that’s because we’ll be abandoning the treatment for those wells, as well. When you’re pumping from 2,000 feet deep it’s a lot different than from pumping from 140 feet deep. We’d put the shallow wells on a regular maintenance schedule like we do now with our wells that are not compliant with the radium standard. We do have the ability to turn them on in the event of a catastrophic failure/emergency. With regards to the treatment process, the reason you don’t maintain that treatment process is because you can’t turn that on/off. We can’t store chemicals for a long period of time because they’ll degrade to point where you can’t use them.</p> <p>3. Dan—As with any borrowing, it comes to this Common Council,</p>

Committee of the Whole
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Question by:	Question	Answer
	4. Regarding the Compact—do you see anything in the compact that would allow the selling municipality to dictate other things in the municipality other than water? (--i.e.—housing/transit, etc.) making us change other things we do in the City other than to do with water?	4. Dan —There is nothing in the compact that requires that.
Steve Johnson	1. Is there any consideration or talks about combining with what New Berlin is doing to possibly piggyback/combine engineering to eliminate the impact on the flow both ways?	1. Dan —With regards to New Berlin, the return flow is connected to MMSD, so we wouldn't combine with them. We did have conversations with them on the water supply with regards to their route, however, the path that they went through to get the volume of water that they needed is different than the path that we would need to go through to get the volume of water that we need. They take about ¼ of the water that we need so we'll need a much larger pipeline than they needed for the entire city of New Berlin.
Randy Radish	1. With regards to our service area—how locked in would we be to a service area and how easy would it be to amend our service area in the future? 2. How much has the Green Bay cone area recovered over the last 30 years? 3. The City of Milwaukee is trying to hit some of the outlying communities for certain costs that were never discussed in the past and the infrastructure.	1. The water service area would be locked in when we applied for the Great Lakes. We would not be able to supply water outside of that area without going for an amendment and that amendment would include getting permission from all the other Great Lakes governors. That's why we asked SEWRPC to define the "ultimate" service area for our water service area similar to what they did for our sanitary sewer area. 2. Dan —In the 1950's all the suburbs decided they were going to go with Green Bay, but then they decided to stay on the aquifer thinking there would be plenty of water. The aquifer did recover, but I don't know the exact percentage. 50 years later that aquifer was drawn down and they had the water quality issues that we're seeing today and what they did was switch to a Great Lakes supply. They were unable to come to an agreement with Green Bay during negotiations, so the surrounding cities of Green Bay went to Manitowoc. 3. Dan —That was called the Ad Valorem Tax. The PSC plays a very large role in what they can and can't charge for water. There has been a move recently, which is what I believe you are referring to, with regards to city's being able to obtain more dollars from the utility's because of the fiscal crisis that is being realized by a lot of the cities. So some of the City's are

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Questions/Answers

Question by:	Question	Answer
		<p>trying to get more revenue from their water utilities. The City of Milwaukee has asked for in addition to their PILOT payment \$3 million from the Water Utility. They'd have to get it from somewhere, so they'd get it from their customers. Similar issues are being realized in other cities throughout the state and the PSC has not decided how they're going to deal with that issue. They are really frowning upon that issue. They don't want to see the water utilities become the cash engine for cities to operate. Mayor—Dan, isn't it true that any agreement that the City of Waukesha would reach with the City of Milwaukee, Oak Creek, or Racine come back to the Common Council before it would become an official agreement? Dan—Correct. Any agreement that we would enter into would be negotiated by the water utility commission and would then be presented to the Common Council with ultimate approval by the Common Council. Mayor—We purposely are being upfront about we're looking at 3 possible communities and depending on the letters of intent and depending on our meetings with those communities over the next couple of months, that will depend on who we ultimately end up reaching an agreement with and any agreement will come back to this body for an approval prior to taking affect.</p>
Paul Ybarra	1. Explain why some of the water is 98° at the bottom of the deep aquifer and why it can't be used.	<p>1. Dan – Within the aquifer, there's a number of different strata that you draw the water from and some of the water that we pulled from that aquifer was as high as 98° F and as a result of that, we had to abandon those portions of the aquifer. Before I came to Waukesha, there were some wells that had higher dissolved solids in the well, so what you have to do is fill the bottom of the well and abandon that portion of the well so you're not using that portion of the well to reduce the total dissolved solids. At 98° it would be aesthetically non-pleasing to the customers so you have to abandon that portion of the aquifer that's putting out that water. That also reduces the volume of water that you could pull from that well because the volume of water you can pull from that well depends on the number of feet that you have available to pull water from.</p>

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Question by:	Question	Answer
Kathleen Cummings	1. Has anything been verbally agreed to by the City of Waukesha?	1. Dan —Not that I'm aware of, no.
Dan Warren	1. What are the total capital costs? What is inclusive? Alternatives for return flow—Is it based off of a specific supplier? What is the variability in the supply line cost if we went with another supplier? Order of magnitude—are we talking more or less? Is it fair to say regardless of the community that would supply the water, that the overall recommendation regarding all of the alternatives we've evaluated the fundamental conclusion that most cost-effective alternative, being Great Lakes Water, would remain intact regardless of the supplier?	1. Dan —Capital Costs were \$116 million included the O & M for 20 years. That included the present value of the O & M. The capital costs associated were \$56 million. The modifications to the wastewater are included in the return flow—the \$22 million. Total capital dollars are \$56 million plus \$22 million for the return flow pipeline = \$78 million. The \$22 million capital is based off of Underwood Creek. It would increase from there to the Root River or MMSD. The return flow would be done independent of what community provided us with the water. The specific supplier is based off the City of Milwaukee. I believe it's \$15 million, but I'm not sure. I wouldn't say regardless of the supplier, because there are a number of different factors that come in to play with that. It would depend on the contract negotiated and what the cost of the water is and what the hook-up location is in terms of where we get the water from. In terms of who the supplier is, there are a number of variables that come in to play with that that would then fall into what we negotiate the contract is. To whether the Great Lakes supply or the western well supply would be the most cost-effective.

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	<p>2. Regardless of the community that would supply the water, is it safe to say that the amount of water that can go down the river (--i.e.—Underwood Creek) even in the most extreme cases, the ultimate dry weather we would still have some water going down a return flow alternative rather than everything going back to the Fox River or vice versa. Would there always be return flow? There would be certain conditions where some would be going in both directions?</p> <p>3. Clarify the analysis that has been done pertaining to the environmental benefits to Underwood Creek, as an example, share with us an analysis which we may have done on the other side with regards to Fox River/Vernon Marsh relative to less water coming into there from our wastewater plant pertaining to normal daily flow.</p>	<p>2. Dan—In that situation we would most likely have our average day demand minus our consumptive use going back which is what's allowed under the compact, and the remainder going to the Fox River. What we look for is to work out that final operations plan is going to be with the DNR and how exactly they would want to handle those extreme scenarios. There would always be return flow. The other condition would be the wet weather condition where we have a 100 year rain event where our wastewater facility is treating more water than we would see on that average day. We would scale back the volume of water that we send back to the average day minus the allowance of consumptive use to minimize the perceived impacts that there would be to the Underwood Creek or the Menomonee River. At that point, you would be sending 7 or 8 cubic feet per second when the stream has 1500 cubic feet per second, so it would a small fraction of the amount. (I'm just using those numbers as an example.) There would always be return flow that would meet the requirements of the compact going back to the Great Lakes Basin.</p> <p>3. Dan—There has been analysis done, we've monitored and we've worked with the wastewater utility with regard to what their flows have been throughout going back 15—20 years with regards to wastewater discharge and wastewater flows and looked at some of the gauges within the Fox River and what that impact would be to the Fox River and downstream to the Vernon Marsh. We are still working on that analysis and SWRPC has also looked at that analysis. This is something we would bring back at the December or January meeting. Jeff—The Vernon Marsh is fed by the Fox River primarily during the flooding events. Those are still going to occur and the utility's treated wastewater doesn't really impact that. In terms of the streams that are feeding to the Vernon Marsh, those would be directly affected by pumping from a well over a long period of time.</p>
Rick Tortomasi	<p>1. Do you see anywhere in the future a possibility of using well water with pumped water from Lake Michigan and supplementing it so we don't have to take as much water from Lake Michigan?</p>	<p>1. Dan—This would fall more into our Operating Plan. It's very difficult to mix water chemistries of well water and surface water. Only potential would be for peaking capacity. A lot of times there will be limits on the volume of water that you can take at a specific time, so when you are getting to that threshold, you would turn on the wells with a knowledge that most of that</p>

Committee of the Whole
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Questions/Answers

Question by:	Question	Answer
		water is going to end up on the lawns. In the event of a catastrophic failure of the line bringing the water to Waukesha, you would be able to provide your residents with a water supply and fire protection.
Paul Furrer	1. Is it possible to have 100% of return flow to Underwood Creek?	1. Dan —We have done a lot of analysis on the volume of water that is available for return flow and I believe it's about 20% more than what we utilize on average treated by the wastewater facility. There's been mixed signals from a lot of different groups, as to what that amount should be. The compact says you need to have return flow minus an allowance for consumptive use. It doesn't mean we wouldn't have a goal for reaching 100% return flow, but what is the law is return flow minus an allowance for consumptive use. Jeff —The compact actually says you need to maximize the amount of water returned back to the source water shed and you have to minimize the amount of groundwater from this basin to Lake Michigan. You want to create a water balance. The improvement isn't so much in the quantity, but the levels and the flows and quality that would go back. We're providing additional level in the stream for fish passage and also for potential water quality improvements. On the wastewater side, infiltration and inflow is a bad thing. We've met with our Director of Public Works, Fred Abadi, who made us aware that they're entering into programs to minimize the amount of infiltration and inflow that they have.
Audience	1. If the Lake Michigan diversion is \$116 million and the shallow wells are \$145 million, isn't the true cost \$261 million if you are using the shallow wells for redundancy? 2. Will there be an opportunity for an open session process by the Mayor for the media, public, etc., to make comments, express their opinions? 3. What is the planned pipeline routing to and from Waukesha? Has there been discussion, preliminary negotiation with	1. Dan —No. The shallow wells we are referring to would be a new shallow well field that we'd develop outside of what we have and outside of what we're currently planning to have. 2. Mayor — This meeting tonight we had set a goal to end around 9:00 because we felt with this presentation, until we're ready to present the Draft Application that are a lot of details that still need to be worked out. Our plans for the December/January meeting will have a starting time, but we won't have a definitive ending time, so depending on how many members of the public show up, we will come up with a process for people to make comments and express opinions. In December we plan to unveil the draft and have questions on the first draft depending on how that meeting goes will determine if we need additional meetings for questions. When the

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Questions/Answers

Question by:	Question	Answer
	<p>jurisdiction with path of the plan—possible return flow routes?</p> <p>4. Is there actual data documentation and actual reports showing how WWU Commission studied the alternatives to diversion?</p> <p>5. Will costs of whatever route to a better water supply chosen be entirely on water rates or will any of it be on the City tax levy?</p> <p>6. How much will property taxes go up as a result of getting Lake Michigan water?</p>	<p>Water Commission has a special meeting to determine whether they're not going to recommend moving forward, we'll allow for discussion at that time, and as part of our regular Common Council meetings we always invite public comment.</p> <p>3. Jeff—It would come from the west side of Milwaukee using existing rights of way. It would be approximately 10 miles in length and come in from the north—around 92nd and Howard. Dan—There is an east west corridor we have identified and that's been identified in the SEWRPC Plans also and as far as the details of getting the pipe to and from that corridor—those routes have not been identified at this point. Mayor—We have not had any negotiations with any jurisdictions. We have had informational discussions with the Mayor of Milwaukee and some of the members of the Milwaukee Council. We've had discussions with the Mayor and some of their staff for Wauwatosa, West Allis, Racine, Oak Creek, and the Village of Elm Grove. Our plan is once the application is made public we would have more meetings. Dan—I believe there is a second alternative that would be around the Zoo, but I'm not exactly sure where that is. The finalization of any route will have to be approved by the WDNR.</p> <p>4. Dan -The following reports are on our website "Our Future Water Supply Study", S E H Study at www.ci.waukesha.wi.us/water utility. Volumes of information are also available at the SEWRPC website with regards to the analysis that was done.</p> <p>5. Dan—The bonding for water supply would be bonded by the water rates. The bond itself would have to be issued by the City of Waukesha and it would not be anticipated that any of the dollars for paying those bonds back would come from the City of Waukesha.</p> <p>6. Lori –The intent is for any or all expenses to be paid directly by the Water Utility through its rates, so there would be no impact on the property taxes.</p>

Committee of the Whole
January 28, 2010
Questions/Answers

Question by:	Question	Answer
Joe Pieper	<ol style="list-style-type: none"> 1. With alternative #1, the treated water pipeline that would go from the proposed well field in the south all the way up to the Hillcrest Reservoir & Booster in the NE part of the City—explain why that pipeline is needed. 2. Alternative #1 would need system improvements to get the vast majority of the newly treated water up to the north and east part of the city to let it flow through the existing distribution system. Correct? 	<ol style="list-style-type: none"> 1. Dan—These numbers include distribution system improvements that will be necessary within our system to distribute water throughout our system. Right now, by putting that water to the south and the need to transfer it throughout our system, our system isn't built like that now, we need to install the improvements to move that water throughout the system. All 3 options include those numbers to make it equal (apples to apples). 2. Dan—The Hillcrest Reservoir is one of the main distribution points in our system. It's at a high point and it provides the water that moves throughout our central zone and then it gets distributed from that point to the northwest and southeast.
Joan Francouer	<ol style="list-style-type: none"> 1. Common Council decisions points slide—approval of supply by Great Lakes states. What is the indication that we have that it's a reasonable timeframe given all the complexity and even the lead up to getting the compact signed by the Great Lakes governors? 2. Is the first application that will be seen by the members of the compact? 	<ol style="list-style-type: none"> 1. Dan—The goal for approval by the DNR is to have it reviewed and approved within 90 days for a permit and also a goal in the Great Lakes compact to have it reviewed and approved within 90 days. That's once they view it as complete, so we need to work with them to provide them with the information so they can do that as complete. We look at the 90 days for each of those and then some extra time in terms of providing them that information. 2. Dan—This is the first application that will be seen under the Great Lakes compact. There have been other applications for Great Lakes water that have approved and also that have been denied.
Paul Furrer	<ol style="list-style-type: none"> 1. We don't have a water problem, we have a political problem. The EPA could change things for us with a stroke of a pen by upping the radium allowance. Tell us why a political thrash down and delaying tactics isn't an option. 	<ol style="list-style-type: none"> 1. Dan—When you look at the process we need to go to implement a new water supply it would take about 5 years from when we get approval to when we start the process to implementing that process. That takes us out 5 years within that timeline. We did look at the water softeners, the issue is a lot of times the cold water that goes to your kitchen sink is not plumbed through the water softener, therefore, the radium is not removed from that stream. We would also be taking on the liability to be guaranteeing that those water softeners worked and removing the radium throughout someone's household. I don't believe the City Attorney would allow us to take on that liability. Therefore, it is not an option. Our City Attorney, the Water Utility, and the City spent a lot of time fighting

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		<p>the standard with regards to radium because the standard is different in different countries. Curt—An interim standard that went back longer than I’ve been City Attorney, the process we had been involved trying to negotiated with EPA, probably since the late 80’s. Originally, the DNR did sue the City back in 1990 to comply with an interim standard—we felt it was not appropriate because the EPA had made its intentions known that it was interim and was going to change the standard and that it did not make any sense for a municipality to comply with a standard that was ultimately going to change. As it turned out, we went back in the early 90’s and argued our case before the Court of Appeals procedural issue before the State Supreme Court, we were successful. Call it a delay tactic, but it was for the purposes mentioned—positive and good reasons to do so, because at the time we were looking for an expenditure to comply with the radium standard upwards of \$70 million. The operating and maintenance cost was something that may have been in addition to that, I don’t think it included just the billing plan to comply. The DNR, after they lost that case, commenced another action against us in the mid-90’s again to comply. They were going to change the standard—possibly a 20/20 standard for each radionuclide that was in question 226 and 228. The DNR continued to proceed ahead and we were able to come to an agreement with the Attorney General’s office in 1996 (Jim Doyle), not to proceed they wouldn’t do any enforcement action against the City. When the action taken against the City would apply to the other municipalities and water supply systems throughout the State that exceeded the radium standard, until such time as the EPA declared its new standard. That process ultimately came about and in 2002 they went through the whole public process—adopted the regulation—we submitted information (as well as a number of other communities) most effected by radium (Illinois, Nebraska, Texas, but Waukesha was the biggest), with scientific evidence that standard of 10 or 20 supporting that was better than the proposed 5 standard that ultimately that EPA relied upon. We did challenge that along with</p>

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		<p>several other groups and the EPA determination and where you challenge an EPA regulation is in the Court of Appeals in the DC in Washington DC. It was clearly an uphill battle every time you challenge an administrative rule of the federal government; the courts are not going don chemist robes or make an independent determination. They look at the standard on what basis or scientific data was relied upon by the EPA in making their determination. You might have other data that is equally acceptable, viable. We did have a number of studies—1 by UW-Wisconsin and one by an expert from Oregon laboratory, as well as a Canadian group, but the courts are not going to decide between whether the EPA's was more scientific vs. the parties challenge it, the standard is whether the EPA's standard information they relied upon, which happened to be a cancer in radium dial painters that were prevalent in the 1920's in the rate of cancer and Hiroshima, as long as what their basis for concluding with a standard is reasonable. Very difficult standard to overcome. They relied on no scientific data or was totally unreasonable. The decision came down that the EPA standard was reasonable that promulgated in 2002. It's a long process and highly unlikely that they would change it. Highly unrealistic to think they would change the standards. 2018 to comply with the radium standard—I can't stress enough though, as Dan and the people here say, radium is piggy backing. The main reason again for looking for Lake Michigan and other alternatives is because of the declining aquifer not because of the radium. There could be compliance by itself, but it wouldn't make much sense if you are looking at long-term and as we continue using our existing water, as the engineers can tell you, the potential for other contaminants is getting greater and greater as they have to go deeper and deeper into the aquifer.</p>
Terry Thieme	1. I was going to state the same as Alderman Furrer, as far as a strike of the pen by the politician and ask Curt the comment on the lengthy legal challenges the City has already been through on this.	No Comment

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Joe Pieper	<ol style="list-style-type: none"> 1. Another question in regards to the alternatives—in terms of Alternative #3, which would be Lake Michigan, we've put out letters of intent from Racine, Oak Creek and Milwaukee for potential purchasing of water. Where on this diagram—which municipality does this represent? 2. If Great Lakes is the ultimate option that's chosen by this council, if another municipality besides Milwaukee were chosen, would this diagram change? Would the route of the pipelines be different than what's articulated on this alternative? 3. Would the return flow still go to Underwood Creek or would it go back towards one of the municipalities it chose? 4. You had mentioned that Alternative #1 and Alternative #2 are not sustainable. Your concern is 20-30 years we would have to do this all over again. Can you expand on that point and explain why you feel that way or what would happen in 20-30 years that would cause these alternatives not to be the best choice? 5. I want to make it perfect clear that I would not support purchasing water from anybody that wanted to make purchasing water more about than just purchasing water. If there's a supplier that wants to put things in this contract or any type of 	<ol style="list-style-type: none"> 1. Dan—This particular diagram represents the City of Milwaukee. 2. Dan—The east/west pipeline remains approximately the same and it breaks off from there where it would go towards Oak Creek and towards Racine. It would basically run the same in Waukesha County until it hit the Milwaukee County line and then it would move to the south and to the east. 3. Dan—We are proposing that the return flow would go back to Underwood Creek under any of the 3 scenarios. 4. Dan—There have been a number of studies that have been done. In fact, SEWRPC has done about a 2 year study with regards to the water supply for the region and they came up with the same conclusion that the City of Waukesha should go to Great Lakes for water and there was a panel of 37 water experts that sat on that review committee and came to the same conclusion, but under that scenario, what was developed was a look at the shallow aquifer and there was a model that was created and an index that looked at the shallow aquifer to the south of the City and what would happen if you took 3—4 million gallons/day from that aquifer. There was a base flow reduction index that was created—you would reduce that by about 50 percent. We're not talking about ultimately talking about taking 3—4 million, we're talking about ultimately taking half of our water and so we have to model that and it would be above that 50 percent mark, so you would be having severe environmental impacts adjacent to that area where you would be drawing down that aquifer for long-term. The other thing, during a serious drought condition, the groundwater goes down as a result of that drought condition as does the flow in the Fox River. So under either scenario during that drought condition, you are going to additionally stress and already stressed resource. Tony—There are other people on these aquifers, too, not just Waukesha. So as they grow in the future, it's more water coming out of the same water source.

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	<p>perspective contract, that don't have anything to do with water, I won't support it. I think it's important for us to understand that if we entered into an agreement with an municipality, we're buying water from you and that's it.</p>	
<p>Terry Thieme</p>	<ol style="list-style-type: none"> 1. We purchase water either from Racine, Oak Creek, Milwaukee; will we be at their mercy? Can you explain the process as far as the regulation that it's simply about the water. 2. Whatever option we decide and if it is Lake Michigan water, no matter what municipality we would seek it from, they can't impose any type of fees just simply to make up their budget so their budget balances. Correct? 	<ol style="list-style-type: none"> 1. Dan—In the State of Wisconsin, the utilities are regulated by the Public Service Commission and the way they set rates is they do a cost of service study. They look at your utility and what it costs to provide service to the customer class. We would be considered as part of a customer's class from any supplier and that customer class would be the wholesale customer. For instance in Waukesha, there's the industrial class, residential class. They break those out and look at what it costs to provide that service and they allow for a certain rate of return on that so the utility can invest back into their infrastructure and the PSC will not let you set rates higher than what that cost of service study dictates and the rate of return you will allow. While a water supplier might say, we want to double your rates, but not their rates; they wouldn't be able to do that. The PSC would not allow that and if a customer wanted certain payments or whatever, the public service commission has ruled that they will not allow that to be as part of it. As part of the regulatory process, we'd have to go in front of the regular PSC and they would have to approve the rates as a regulatory body. 2. Dan—Correct. If they had a deficit one year and they wanted to make it up through the water rates, they would not be able to do that. Like any other Utility does, they'd have to go through the rate process and justify those rates in front of the PSC. Mayor—The negotiations for any agreement would be lead by Dan and Lori Luther. They would be entering into negotiations on behalf of this Common Council. Any type of agreement would come to this Common Council for a public discussion and would not go into effect unless this body ultimately agreed that the negotiated conditions were acceptable.

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Steve Johnson	<ol style="list-style-type: none"> 1. There's a map of the water service area as defined by SEWRPC and I'm assuming that this is made up of the 20/20 land use plan for the city? Does it extend beyond what that was? 2. You had mentioned that any other annexation beyond this border would have to go back through the whole process again for water service which would be outside of the service area that we're applying for. Correct? 3. So it would be just a basic looking at the agreement and doing an amendment? Even if we weren't going beyond the volume that we planned because we had set borders? 	<ol style="list-style-type: none"> 1. Dan—What SEWRPC did is they defined our service area. Then we asked SEWRPC to tell us what the ultimate population will be of this service area at build out. They looked at the service area and on the map they identify what's already developed, which is in blue and they look at the environmental corridors which are green and the grey areas which is the land that is available for development. The service area that we have is 85% developed. There's only 15% of land available to be developed in the future. So SEWRPC defined the available land for development and projected a population based on the ultimate land use of that area as how it sits today and I believe it was based off of the 20/20 plan. 2. Dan—Correct. Just like the sewer service area of the plan, like when the city looked to provide service to the City of Wales, they had to amend their sanitary sewer service plan, and they had to go to SEWRPC to amend it, we would have to go through that same criteria on the water side. 3. Dan—In terms of water supply, with regards to Great Lakes water supply. If we wanted to take and square off this area and add a bunch of acreage to this, in order to supply that area with water from the Great Lakes, we'd have to go back to the DNR and ask for approval and they would have to go to the other Great Lakes governors and ask for approval or an amendment to our service area. We would have to go through the whole process again. That's part of the legislation that you have to identify your water service area and that's what we did when we went through this process with SEWRPC.

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Emanuele Vitale	<ol style="list-style-type: none"> 1. We should not be buying water from any community on the Great Lakes that will have political demands or conditions for sale of their water. How many other communities are obtaining their water from the deep aquifer besides the city of Waukesha that's in that plain? 2. Could we conceivably run out of water in this aquifer in 30—40 years? 3. Our population isn't exploding and we are using conservation more and more—we use less water now than we did 10 years ago per capita. Is there a possibility where we don't have to go with Great Lakes water? This is going to be a terribly expensive proposition because a lot of people don't realize is what water we take out we have to send back. 	<ol style="list-style-type: none"> 1. Dan—I don't know that number off the top of my head. Tony—I don't know the exact number of communities, there are several. 2. Dan—No, we would probably not run out of water, but the water would have more contaminants and we'd have more treatments that would be necessary. The study we went through looked at treating the deep aquifer water, treating the shallow aquifer water and those are the other numbers that identified as the other alternatives in here providing that treatment. The more and more we utilize this aquifer the more and more the drawn down gets and the more environmental damage that will be caused. We are west of sub continental divide, but we're within a straddling county. 3. Dan—The other alternatives we looked at are just as expensive as or more expensive than the Lake Michigan option in terms of treatment costs and environmental impacts. Those costs are identified. Any route, I agree, we're looking at spending a lot of money, but any route we go, if we're going to be spending money and we have this court order by June 2018 and under that scenario the recommendation is to develop a new water supply. There will continue to be environmental damage and if we start moving to the shallow aquifer, there's going to be the drawdown in the shallow aquifer and those draw downs and environmental impacts are closer to where you are pulling from so they would be in the land directly adjacent to those wells. We have the iron, manganese and arsenic that we have to treat for with regards to the shallow wells.
Carrol Waldenberger	<ol style="list-style-type: none"> 1. I understand New Berlin currently gets water from the city of Milwaukee. Has the City of Waukesha reviewed that contract to see what kind of conditions are involved with that particular contract? 2. Is it purely a water contract or are there other conditions attached to New Berlin accessing Milwaukee water? 	<ol style="list-style-type: none"> 1. Dan—We have looked at the contract. I cannot recite it off the top of my head though. 2. Dan—There are not all kinds of conditions attached. The only thing that was unique about that contract was that there was a onetime payment that was required as a result of the contract. 3. Dan—As you are aware, we are looking at purchasing the Lathers Parcel where there's potential to install as many as 3—5 wells on that parcel and we're in the process of identifying other lands to the south to

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	<p>3. With the long-term goal of Lake Michigan water supply for the city, is the city still pursuing an additional water supply via additional wells and, if that's happening, what is the status and cost of that?</p> <p>4. 2018—seems like a long way out, but if there are any delays in the approval process or any kind of legal challenges to accessing or getting approval for utilizing Lake Michigan water, that's going to delay any contracting for design and construction purposes, so none of that is going to take place until this is already to go. Correct?</p>	<p>the east that would be in another well field that would be adjacent to potentially develop that additional shallow well field to supplement that.</p> <p>4. Dan—Correct. If you remember the timeline that I had there was about an 18 month buffer that would be available for any legal or construction issues that came up. It's important that we move this process now and start moving forward so we can get to that point where we can select the new water supply. Mayor—We are estimating just the process for this application to take one year. We're estimating 5 years even if we were successful to design, build and implement.</p>
Kathleen Cummings	<p>1. Have the scientists been able to tell us how long it would take to regenerate the deep aquifer, if we were to do the Great Lakes supply and give the deep aquifer a rest.</p> <p>2. Do we know all this as it applies to the City of Waukesha?</p> <p>3. Is there a 3rd possibility—east/west replenishing the aquifer and a multi-faceted solution over the next 50 years—has anyone looked at that piece?</p> <p>4. I would like to know how much money we've spent as Utility and City, on indirect or direct water issues going east/west. I want to make sure we're equally looking at everything fairly.</p>	<p>1. Dan—The scientists have indicated and the only statistics I can give you is that everyone gets off the aquifer it would recover 50 or 70% in 7 years and 90% in 9 years. Tony—that would be the best case on exactly how many years it would take.</p> <p>2. Dan—We know if we get off the aquifer it will start to recover.</p> <p>3. Dan—That's a good question with regards to Lake Michigan and well option. The issue is you would have double the expense because you would have to build the treatment facility for the shallow wells and all the infrastructure to distribute the water, but you'd also have to build all the infrastructure from the Lake Michigan and the return flow. So, you'd have a higher expense if you looked at a combination. From the construction standpoint you would have an issue and from the water quality standpoint you'd have an issue because they are two different chemistries of water. I can tell you they don't blend very well, so we look at utilizing potentially our shallow wells in case something catastrophic happened.</p> <p>4. Dan—In 2002, when we implemented the future water supply study. We looked at all the different options and what's available to us—whether it was damming up the Fox River, utilizing the quarry water,</p>

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		<p>water re-use, we looked at all the options. There was nothing in that study that was pointing towards one option as the option that was our preferred option. That study said the Great Lakes and shallow aquifers were the two preferred options. SEWRPC spent 2 years studying this issue and came up with the same conclusions the future water supply study did. I don't know how much has been spent from the water utility standpoint, I know that throughout the region millions of dollars have been spent looking at water supply options. SEWRPC alone was an enormous task and burden taken on. The Great Lakes is an option for us and one we should be pursuing as an option.</p>
Randy Radish	<p>1. I would like to thank Dan and the water commission. There has been a lot of work done on this issue over the last ~20 years. So it's safe to say we aren't rushing into this. This hasn't been a "big hot issue" because it's been slowly developing over time. Something has to be done—a decision has to be made. We are very fortunate to have Dan here—he is unbelievably qualified. If you want to call him a water geek—he is. The amount of information and the amount of data that's been pulled out about this issue and the people you've assembled is amazing.</p>	<p>1. Dan—I express my appreciation on behalf of the water utility commission and myself and you bring up a valid point. These documents that are sitting on this table here are just some of the supplemental material that is included in our application.</p>
Emanuele Vitale	<p>1. Where would the water be treated that would be extracted from Lake Michigan? 2. Would Oak Creek have the capacity to treat the quantity of water this city would require? 3. There is a perception amongst some people in this community that are a little queasy about getting Lake Michigan water from the City of Milwaukee due to their</p>	<p>1. Dan—All 3 of the communities have water treatment plants that exist along the lake. Oak Creek and Racine each have one and Milwaukee has two. They would treat it at their facilities. The wastewater facility that we have currently in the City of Waukesha would continue to treat the wastewater to the standards that it has already existing in its permit and where we discharge to the Fox River. We would be looking at changing our discharge permit and location from the Fox River to Underwood Creek. Great Lakes water would be treated at an existing</p>

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	<p>cryptosporidium situation about 10 years ago. I did speak to you about it about 6-9 months ago, but the perception is still out there. That's why I asked where the water would be treated (double treated) to make sure we don't get this cryptosporidium. I know you've explained to me that they've improved their water purification system, but the perception is still out there and I'm concerned about that. Please elaborate this improved system that they have.</p> <p>4. It seems to me the greatest cost is going to be the return water. A lot of people aren't aware in this community that water we take in we have to bring back. That would include, I assume, everything that our sewage treatment plant treats, correct?</p> <p>5. Do you have any idea of what costs we're talking about as far as all this pipe that would be required?</p> <p>6. How would this affect the water rates over the years?</p> <p>7. The rates you are talking about would be condition upon the amount of state dollars we would receive?</p> <p>8. I can expect the rates are going to be astronomical because Wisconsin is almost broke, the federal government is almost broke. I'm a little concerned about that—you make it sound like we'll be able to get state and federal dollars at the snap of our fingers. That's not going to work—they</p>	<p>facility along the lake that has the available capacity to provide the city of Waukesha with their water and then the wastewater facility would continue to treat the wastewater and we'd change the discharge location.</p> <p>2. Dan—Both Racine and Milwaukee have ample available capacity to provide the City of Waukesha with the water on its max day the 18.5 million gallons that we are looking at requesting. Oak Creek has enough capacity to handle the request we would put in right now, and they have enough available capacity within their infrastructure at their treatment plant. They'd have to add on some treatment processes to allow us to provide water on our maximum day when we reach that 18.5 million gallon threshold.</p> <p>3. Dan—Since that event that took place in the City of Milwaukee they've installed an Ozonation System that provides as a barrier to the cryptosporidium virus and also provides a barrier for another of other things that are out there. The City of Racine also had an incident and they had since installed a membrane treatment that polishes off the water. Basically, they treat their water and put it through a membrane system as another barrier. One thing I'd say about the City of Milwaukee since that outbreak, they have improved their system dramatically and they were recently recognized as having the 19th best water amongst large communities throughout the country. They have very high quality water and they're run by a very qualified manager.</p> <p>4. Dan—The compact calls for you to return the water minus a consumptive use. We would be looking to meet the requirements of the compact on an annual basis and looking on a 5 year rolling average of having a goal of returning 100% of the water to the Great Lakes basin so it is more sustainable for the long-term. That's what makes this more environmentally sustainable for long-term is that you are recycling and reusing the water that you utilize for your citizens rather than having it sent down to the Fox River and it's lost forever.</p> <p>5. Dan—The cost for the return flow and the supply are included in the</p>

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	<p>don't even have money to fix bridges in Milwaukee.</p> <p>9. I appreciate that, I know you've worked hard doing this and your efforts are greatly appreciated, but you're talking \$5/\$6 million dollars and we're talking how many millions? \$164 million? So that \$3 or \$4 million is chicken feed at this point in time. It's helped our radium process, but I'm concerned about what's going to happen 8/9 years from now.</p>	<p>numbers that were provided for you, so the return flow is also included in those numbers and the Great Lakes option is the cheaper option.</p> <p>Tony—For the Lake Michigan, the total capital cost was \$164 million, about 30 percent of that is for the return flow. There's a little bit larger portion for the supply from a Lake Michigan utility and there's also some of those distribution system improvements we talked about to move water around town.</p> <p>6. Dan—We've done some preliminary studies, but it's really an unknown, because we are, as this common council and the Water Utility Commission, is aware, they've challenged the staff to look into federal dollars and help assist in the construction costs, so we've been working with our congress and legislator and even at the state level to try and identify federal or state dollars that would be available to help offset some of these costs. Without knowing or being able to predict how much federal or state dollars we've be able to obtain. It's hard to try and figure out what those rates are ultimately going to end up being.</p> <p>7. Dan—As with our radium compliance, we received around \$3.5 million to offset some of radium costs. We'd anticipate federal dollars and we're even looking at the state revolving loan fund as a potential source for money to offset some of the costs that are being associated with the future water supply. It's really difficult until we know what that final supply is going to be and until we finalize the process for the federal dollars and state dollars, we won't know exactly what the impact to rates for customers are going to be, however, the one thing I can tell you, is there is going to be an impact to rates no matter what we do, because every option that we have, there's going to be a cost associated with it.</p> <p>8. Mayor—Dan and I were just in Washington DC and we met with the staff of Senator Kohl, Senator Feingold and Congressman Sensenbrenner and we did get confirmation towards the end of last year we are going to be receiving an additional \$400,000 in federal funds to</p>

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		<p>help with our radium compliance which brings our total to about \$3.6 million in federal funds that we've received through this process. So we already have been successful, because if we didn't have that \$3.6 million in federal funds, our current rates would be even higher than they are. Part of our conversations is looking at other opportunities for federal funds that would help us deal with the long-term costs, so that is something we're working on and will continue to work on.</p> <p>9. Dan—In relation to the radium compliance, we've received about 25 percent of the money towards that radium compliance. The other thing I will tell you is with regards to the Water Utility Commission and the way they've guided us in terms of financial planning, is that when we have bonded for money and we looked at how we're paying off that money and we have a 5 year financial plan that we project off of and as part of that 5 year financial plan we looked out to 2012 and 2013 and we looked at our bond and our payment terms for those bonds and have a decline in those years knowing that something big is coming and that's the advantage of our 5 year financial plan is that we're looking at it out in the future and when we're going to be bonding for money so we can project how we want to pay for things now so we can set ourselves up for that larger borrow in the future. The Water Utility itself would not be a bond for the total dollars we're talking about here, so we'd have to look to the City for assistance in terms of finding that money, but payback of those dollars would come from the rate payers.</p>
Eric Payne	1. If and when we apply for the Great Lakes water and our application is accepted, but we decide not to move in that direction right now, does the application expire if we don't begin construction in x amount of time?	1. Dan —I do not know the answer to that question, I'd have to look into it and get back to you.

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Joe Pieper	1. What I'd like to see between now and the next meeting, is an example of what a water bill would be if we didn't receive any assistance—federal or state. You can use my house as an example of what my water bill would be now and what it would be if we didn't receive any assistance for any of the alternatives from the state or federal government.	
Dan Warren	1. I just wanted to share an observation—I've had the pleasure of serving on this commission for 21 years and my tenure and knowledge about this whole activity with regard to water and radium in water parallels Attorney Meitz's tenure. Very briefly, my first commission meeting we were talking about radium. This has been an issue in front of the Commission and the City for that whole period of time. Water quality issues started to creep into that about ½ way through that process. We start to talk about water quality issues that Dan brought up tonight, as well as subsidence of the aquifer. There are 2 issues we're dealing with here. Appropriately so, this is the point in time	1. Dan —Capital Costs were \$116 million included the O & M for 20 years. That included the present value of the O & M. The capital costs associated were \$56 million. The modifications to the wastewater are included in the return flow—the \$22 million. Total capital dollars are \$56 million plus \$22 million for the return flow pipeline = \$78 million. The \$22 million capital is based off of Underwood Creek. It would increase from there to the Root River or MMSD. The return flow would be done independent of what community provided us with the water. The specific supplier is based off the City of Milwaukee. I believe it's \$15 million, but I'm not sure. I wouldn't say regardless of the supplier, because there are a number of different factors that come in to play with that. It would depend on the contract negotiated and what the cost of the water is and what the hook-up location is in terms of where we get the water from. In terms of who the supplier is, there are a number of variables that come in to play with that that would then fall into what we negotiate the contract is. To whether the Great Lakes supply or the western well supply would be the most cost-effective.

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	<p>where a lot of questions come up about this alternative, quarries, etc. My advice is that individuals need to get a little look at that 2002 future water supply study because of all of the various alternatives that have been brought up were looked at and delineated in there. Even I go back to that periodically to remind myself of the detail we've looked at. It's all part of this process that brings us to the point that we're at now when one of the alternatives we're looking at, that the numbers say at this point is the most cost-effective, Great Lakes Water, is the one we're putting a lot of effort into because of a number of reasons.</p>	<p>2. Dan—In that situation we would most likely have our average day demand minus our consumptive use going back which is what's allowed under the compact, and the remainder going to the Fox River. What we look for is to work out that final operations plan is going to be with the DNR and how exactly they would want to handle those extreme scenarios. There would always be return flow. The other condition would be the wet weather condition where we have a 100 year rain event where our wastewater facility is treating more water than we would see on that average day. We would scale back the volume of water that we send back to the average day minus the allowance of consumptive use to minimize the perceived impacts that there would be to the Underwood Creek or the Menomonee River. At that point, you would be sending 7 or 8 cubic feet per second when the stream has 1500 cubic feet per second, so it would a small fraction of the amount. (I'm just using those numbers as an example.) There would always be return flow that would meet the requirements of the compact going back to the Great Lakes Basin.</p>
	<p>I would request that those questions, many of them will be answered in that report. I understand that those questions don't rise to the level of being asked until all of a sudden now we get into a mode where we are spending a lot of time and activity looking at these things. Secondly, as far as the dollars go, the Commission is very interested in what the rates might be and Alderman Pieper, your request is just fine. It's a request similar to what the Commission has been interested in also. We can certainly run a scenario where no grants, no assistance, what is it just as you suggest. We can also bracket what the best case scenario could be and what they look</p>	<p>3. Dan—There has been analysis done, we've monitored and we've worked with the wastewater utility with regard to what their flows have been throughout going back 15—20 years with regards to wastewater discharge and wastewater flows and looked at some of the gauges within the Fox River and what that impact would be to the Fox River and downstream to the Vernon Marsh. We are still working on that analysis and SWRPC has also looked at that analysis. This is something we would bring back at the December or January meeting. Jeff—The Vernon Marsh is fed by the Fox River primarily during the flooding events. Those are still going to occur and the utility's treated wastewater doesn't really impact that. In terms of the streams that are feeding to the Vernon Marsh, those would be directly affected by pumping from a well over a long period of time.</p>

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	<p>like. The bottom-line is we're looking at dollars to solve the problem in the order of magnitude of \$160—\$180 million. This will be by far the largest capital improvement for the City of Waukesha in the City's history. There will be financial consequences to that regardless of grant that we get. We take a look at the operating and maintenance costs that are here. \$7 million—that's close to what our operating budget is right now. So based on operating costs alone, our rates could double. Our Commission, over the past 20 years I've been involved, has been forecasting large capital costs. As it was mentioned earlier, this has crept along just by the nature of the process and the due diligence that must take place to get to the stage that we're at. There is no inexpensive solution to this issue. We have to come to grips with that reality. Regardless of the grants, it's going to be a huge financial impact for this community.</p>	
Kathleen Cummings	<ol style="list-style-type: none"> 1. How large is that 2002 study? 2. Does it have an Executive Summary? I would request that a copy of the Executive Summary be put in our packets on Saturday. 	<ol style="list-style-type: none"> 1. Dan—I'm not sure of the exact size, but it is available on line at the website under the future water supply tab that's on the front page of the city's website. 2. Dan—Yes, it does.

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Questions/Comments from the Audience		
Bill Beglinger 216 S. Mooreland Blvd	<p>Is there any legislation requiring the return of water to a particular watershed like Underwood Creek? Is it required by State Statute or legislative requirement?</p> <p>Depending on how the Great Lakes compact is written, is there any type of language in it should Lake Michigan's water level reach a particular stage, that the water supply is shut off? My fear is that because Lake Michigan has over the past decade actually lost water because of various factors such as the Army Corps of Engineers and the Illinois River that it's allowed water to flow at a higher rate into the Mississippi River, my concern is that there might come a time that we might be left high and dry if Lake Michigan reaches a particular water level, should we go that route. I understand that the City of Waukesha wants to be a model city in the Great lakes water usage—my concern is that if we're allowed, how many other municipalities will want to follow suite and how does that impact the drawdown on the water from Lake Michigan. We talked about the PSC not raising any rates, I guess I have concern with that because they don't have real good track record of not going for a period of time without any time without raising any rates.</p> <p>3. In regards to the legislation issues, if there is no legislation, why can we not return water to the aquifer? If we're pulling it out,</p>	

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	why can't we return water to that as far as the sustainability goes? If we're concerned about sustainability with Lake Michigan requiring us to recycle it, why can't we use that same process with the aquifer?	
Brian Fischer 132 E. Wabash	<ol style="list-style-type: none"> 1. I have a question on the analysis for the maintenance—did anybody include costs that are going to be associated with that Milwaukee resolution in the maintenance budget? The way I look at it, it cost up to \$2 million a year if they go by the one Cleveland has in their report—\$200,000 for 2.5 million gallons p/year. If we're going to take 20 out of there, that's 8 times the amount. 2. I also agree with Alderman Pieper, if anything is added on to this in regards to this for anything besides the water cost I would be fully against it. 3. Nobody has addressed—if you're talking about dumping into Underwood Creek, which means we're going to have to get permits from MMSD. Is that going to drag us into MMSD? 	
Steve Edlin 426 Prospect Ave.	<ol style="list-style-type: none"> 1. Alderman Pieper—along your line of questioning, I'd also like to know, the rate increase, would that be related specifically to Milwaukee water, Racine water, Oak Creek water, or a shallow well, or all the above? We do have 4 different considerations here. If we extend the pipeline to Milwaukee, it's one cost, if we 	

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	<p>extend it to Oak Creek, Racine another cost, our own water from shallow wells is a 4th cost. So there are really 4 different scenarios for our water bill. I know the Waukesha School District this year budgeted an increase for this year alone. That's just this year without the wells-without piping in the water without returning the water. I'd like to know the response you would get for all 4.</p>	
<p>Jeff Scrima 125 N. Greenfield Ave.</p>	<p>1. I'm wondering right now if you are favoring any particular Lake Michigan source. It seems as though you are favoring Milwaukee. I'm sure you are all aware of their resolution which was unanimously passed by their alder people. They want to use water sales to dictate land use, transit, and housing. Land use is what I'm particularly concerned about because in there there's a non-compete clause and economic compensation specifically says for "lost opportunities for attracting new businesses and jobs to Milwaukee and the loss of business and jobs that exist in Milwaukee". That means Milwaukee will have control and impact on our future business and future jobs here in Waukesha. I know that that's going to be up for negotiation and I have no doubt in Dan's or Lori's ability to protect us in those negotiations, however, my understanding in examining the deal with New Berlin is that</p>	

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	<p>is up for negotiation every 4 years. I'm concerned that this starts out with just a few strings attached and then in coming years when we're gone from here, the string has become cables and they will pull the city of Waukesha under. It seems everything here is going in a direction of a multi-faceted approach, which I think is extremely smart, what happens if the Great Lakes Governors council turns down the application? We already put a lot of time and money in that basket—so we need to look at everything. Also, as was mentioned, what happens if the Lake Michigan water level drops? That could be us at a very precarious position. I'm still wondering about the Fox River and the quarries. I read the 2002 report, 2009 preliminary report—they said in there one of the reasons why that wouldn't work was other uses. I know one of the quarries is going to be vacated shortly and the other one not to far after that. So, just wondering if you've absolutely explored that possibility and the timing and what's happening with those quarries and with those owners. The solution might be right in front of us and it may end up saving us a lot of money. I appreciated what Mr. Vitale and Mr. Pieper said about the actual impact on the city residents—right now we're the highest taxed city in the county. That hurts us as far as attractability for people that</p>	

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	<p>move into the area. We certainly don't want to dissuade them by having exorbitant water costs. I want to make a point about SEWRPC—they're full of extremely smart people—no doubt about that—however, their concern is for the region—they're looking at what's best for the five counties. They're not looking at what's best for city of Waukesha. So if they see that Milwaukee has some problems and Waukesha has some problems, lets sort of blend it and spread everything out, that's great—that's what they are supposed to do, look at what's best for the region. What we're supposed to do is look at what's best for city. We need to protect our sovereignty, our right to control our future, control our land use, and control our jobs.</p>	
<p>Jim Bouman 1909 Easy St</p>	<p>1. I was pleased to hear Mr. Warren say he's going to follow-up on my alderman's request so we find out what this is really going to cost. I appreciated his candor in saying it's going to cost a lot. There's 3 things I'd like added to that—I've been attending quite a few water utility meetings and it's interesting—after awhile you get a sense of the by-play and the issues that keep coming up—PILOT—the city in Waukesha has been showing a great deal of forbearance in not collecting the full amount that is required and the PSC has the utility billed into the rates. So</p>	

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	<p>while this is enterprise, it's also being subsidized by the tax-payers. I'd like a report on where we stand with the PILOT and how much more that is going to cost us, not just when we start laying pipe in whatever direction, this year and next year. Another concern is that the Utility revenue is taking a hit. Water sales are down—94%. What they planned to sell this year is what they sold. Much of this is attributable to the conservation effort. People are using less—the effect of that is that when you sell less water, the price per unit of water goes up. The virtual collapse in the new housing development in the community. All of us here now, in my opinion, that we are going to get hit with much higher water costs very soon. Finally, the main use of the infrastructure. This was heard at the last 2 water commission meetings that I attended. We are on a 1% p/year. The water mains should be replaced at the rate of 1% per year. We are well behind that. I think it should be reported to the community. The reason we're behind on this is that we're spending an awful lot of money on consultants and other stuff. The farther we fall behind, the more trouble we're going to have and the more costly it's going to be to replace 1% of the mains per year. I think ~ \$650,000 to do a little stretch of Wisconsin Avenue—needs to be</p>	

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	<p>done before the bike race—this is an early 1900's water main that has to be replaced. There's a lot more of them being replaced at the rate they should be replaced because once you fall behind that 1 percent/year. Your 100 year plan is ruined and more and more mains will be neglected to the point where they require emergency repairs. The community deserves a report on where we stand now with regards to problems with revenue, with projected growth in new water users, with the conservation having an effect on the revenue on the water utility.</p>	
<p>Faye Everson W270S3565 Oak Knoll Drive (Town of Waukesha)</p>	<p>I've been an active observer and participant in the water use, protection, conservation issues in this region for my entire life. I just want to set one thing straight—I haven't read the application—one thing that was stated tonight concerns me. About the litigation that occurred radium many years ago—they said EPA made a political decision on the radium., but they didn't. You need to read what the court said when you litigated with them. The court was clear that the scientific information that the city submitted at the time had no cure review and it wasn't valid and the information the EPA based their decision was purely scientific. It wasn't a political issue at the time and I've researched this forever—when I hear that the EPA made a political decision about the radium—it kind</p>	

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	<p>of makes me hesitant about everything that's presented to me in terms of water use and what the issues are. One thing about the application that I'm a little disappointed in—I correlate this to the regional water supply that SEWRPC completed and some of the recommendations in there and you do include some of those recommendations in your application about water conservation, but one important aspect and recommendation of the regional water supply is protecting the ground water recharge area. There are maps showing the groundwater recharge areas are and what we need to do to protect those. I think if you are going to beef up this application, there really needs to show an effort that the city is going to work at conservation easements or protecting those groundwater recharge areas perpetuity.</p>	
<p>Lori Longtine W271S3581 Oak Knoll Drive</p>	<p>My question is for the water utility—you mentioned that there's going to be an environmental impact statement required by the DNR, but I didn't hear any mention of how that environmental statement study process is going to be incorporated into the timeline—I heard 90 days from application until DNR approval/denial and another 90 days that the Great Lakes governors will have to review the application. Where does the EIS fit into that?</p>	

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James Rowen 3107 N. Hackett Ave Milwaukee	How is the SEWRPC report characterized in your draft application—for instance, on page 4/5, there's a box that says SEWRPC recommended that the city of Waukesha switch to a Lake Michigan water supply. My understanding is that SEWRPC—the commission hasn't recommended anything. SEWRPC has an advisory committee that has produced draft recommendations, but that entire report has been held in abeyance because there's still a portion of the study underway that could affect the draft recommendations. Elsewhere in your report you refer to it as a draft recommendation, but stating it so clearly in the box as SEWRPC recommended, my understanding is that that's not accurate and maybe you would want to make this consistent with what SEWRPC has or hasn't done until SEWRPC the commission makes a final recommendation to the commission itself. Secondly, just an observation on the timeline, I remember being here about a year ago when you sponsored a presentation by the author, Peter Anin, who discussed water issues broadly and discussed the compact and the process and how applications work. Unless I'm wrong, Peter Anin is the recognized expert on the compact and its implementation said "A City making an application for diversion should expect that its application will be turned back by at least	

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	one state for substantial reworking”. Does your timeline incorporate that type of delay that’s already been predicted by an expert speaker?	
Jodi Habish-Sinykin 1970 W. Green Brook/Milwaukee County	I work a council with Midwest Environmental Advocates and along, with Dan Duchniak and others, I was involved with the Legislative Council Special Committee on the Great Lakes Compact and Act 227. As the application makes clear in Section 6, there are a couple of key components of the Great Lakes compact that other states that we will be looking very closely at. Breaking them down into two parts—the one first aspect is that there will be a requirement and evaluation that there’s no reasonable water supply alternative in the basin that the City of Waukesha resides which is the Mississippi River basin. What is the challenge in regard to SEWRPC’s findings concerning sustainability for the shallow aquifer? How will this application reconcile the SEWRPC preliminary findings in that regard with that requirement under the compact that will be evaluated at the regional level? Is the requirement that there will be no adverse environmental impact to the quality or quantity of the waters of the Great Lakes basin? Again, with the DNR’s requirement of a comprehensive environmental impact statement, how will that be addressed and how can that information be brought before	

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	the public and before yourself to assure that that component of the compact is met sufficiently so others around the region will follow suit when they make diversion applications that the bar is appropriately set?	
Cheryl Nenn 2400 N. 58 th Milwaukee Milwaukee River Keeper	Looking to return the flow in a 5 year rolling average and what that means? You mentioned of water quality supplier, that the return flow would still be going to Underwood Creek—looking for clarification on that, as well. Both points seem creatively meeting the compact requirements, are the interpretations of those provisions be affecting the very aggressive timeline you set forth?	
RESPONSES TO QUESTIONS/COMMENTS FROM AUDIENCE		
	Is there legislation that requires the return of the water?	Yes. The Great lakes compact requires the return of the water to the Great Lakes basin.
	If Lake Michigan reaches a certain water level, will water be shut off?	There is nothing in the compact like that and we would be putting water back into the lake, recycling that water. We would not be pulling the water out of the lake and having a negative impact on the lake. We are recycling and reusing that water so there's nothing with regards to it being shut off. When we would hook up to an existing system we would become part of that system. The entire system would need to be shut off in that case and there would be a lot of people that would be out of water.
	How many municipalities will follow suit? What will they have to go through?	At this time, we don't know. They will have to go through the same process that we would go through as applying for Great Lakes water.
	If there's no legislation, why can't return water to the aquifer?	There is legislation that prevents it or there's a DNR code that prevents it. There is a DNR rep in our audience and he could probably answer what the code is.

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	Costs associated with the Milwaukee solution.	They do not include the other costs that could potentially added to any agreement and they do not include those costs—that will be negotiated. We can't put in there what we don't know and what will or won't be included. That will hinge on negotiations and one thing about negotiations is that contract that's negotiated will come back to this Common Council for ultimate approval so this Common Council will have a say as to what that contract looks like and what's included in it. In the cost estimates we did incorporate the proposed Milwaukee rate increase.
	Are we favoring any particular Lake Michigan solution?	No. It depends on negotiations and the Common Council approval of those contract negotiations.
	New Berlin is up every 4 years?	That will negotiated in negotiations.
	What happens if the Great Lakes Governors turn down the application?	That is why we need to act quickly because we only have an 18 month buffer in our timeline and if they do turn us down, we need to go to an alternative solution. We cannot wait and we cannot slow down. This process has been started well before 2002.— <i>Mayor</i> —Isn't it true that in the compact that if one of the states says no there may be an appeal process we might pursue—Correct. That is one of the legal things that could take time.
	Have we absolutely explored the options of the quarries?	There is not enough water—that's addressed on Page 231 of the Future Water Supply Study. There may be a lot of water in there now, but when you take that water out—the sustainable amount of water that exists within the quarry is ~ 2 million gallons per day and the quality of that water is suspect—it would be considered under the influence of surface water and we would have to treat it to surface water standards, so we'd have to build a surface water treatment plant to provide treatment for that 2 million gallons/day.
	With regards to protecting the groundwater rate charge areas and looking at the potential conservation easements, that's a good comment and we'll take that into consideration.	

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	The EIS required by the DNR, how the process will be incorporated into the timeline?	The DNR has indicated that they will work us with our timeline, they are looking at releasing a scoping document next week with regards to the EIS.
	How does the report characterize in the application with regards to the SEWRPC? It says it's the SEWRPC recommendation when it's actually the preliminary recommendation?	That is absolutely correct and we will correct that in the application documents.
	Regarding the timeline and incorporating time for the delay.	The document says that it should take 90 days, and we agree it may take longer, and that's why we need to start now—we only have that 18 month buffer.
	The requirement of no reasonable water supply alternatives and challenge regarding that.	There are definitions within the implementing legislation that everyone that was on the compact implementing committee agreed to and supported when that was legislation was passed and we will look to meeting the requirements set forth by those definitions.
	The 5 year rolling average and what that means in return flow going to Underwood Creek.	We will always meet the requirements that are set forth within the compact, however, we have a goal here that exceeds the requirements of the compact and that would be to return 100% over a 5-year rolling average. We would meet the requirements set forth in the compact which is returning the water minus consumptive use, but our goal would be to return 100% of the water to the Great Lakes basin on a 5-year rolling average. Mark —Return flow to Underwood Creek is the preferred option regardless of Lake Michigan water supply and that meets the legal implementing language returning it as close to the source as possible, including the exceptions to that. DNR permit is required—not MMSD

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Question by:	Question	Answer
<p>Brian Andringa 2215 Yvonne St</p>	<p>Beginning of the school year where my daughter goes to school, I was told that working with the city that our school had was a waste of time. Since then I've realized that working with a number of aldermen here, it's the exact opposite. That's why I came tonight. I was probably one of the first ones here and over the past 2 hours I've listened to both sides of the issues here and I agree both. I'm a little confused when you say a great turn out. There are empty seats, empty parking places and I have a feeling that 80% of Waukesha residents aren't going to know much about this until they get their water bills and there are some great options here. I understand something has to be done soon. If you add what our water rates are going to be—something has to be done. No matter what route we take it's going to cost, but please remember that with everything else going on with the economy with the school system that's going to need a lot of money to stay afloat with chances of public employees being laid off, teachers, etc., even though this may seem like a small amount—those 80% are going to find out pretty soon and they're going to be pretty upset. I found out tonight that everyone here has done a lot of research. I talked with a number of aldermen the last few weeks and I found they know what they're talking about with what information they have. I suggest you may find a way to let your constituents know, because in the next 2 years, residents of Waukesha will have to pay a lot more money in property taxes. When you get a water bill and it's double to triple of what you're paying before and they weren't smart enough to have been here this evening—they're going to be angry. It's going to be their fault, but they're going to blame you.</p>	

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Question by:	Question	Answer
Sally Michalko 1615 Dover Drive	<p>Is the handout we received tonight going to be available for online?</p> <p>My question is in regard to the February 16th article in the Freeman by Jeff Scrima—<u>Water is about way more than water</u>. “Do we want Milwaukee dictating our businesses and jobs forever more through water?” Today at the bottom of the front page of the Freeman, it says “We need a source of Waukesha which protects Waukesha’s independence.” Please clarify for me what these issues are. How would entering into an agreement with Milwaukee dictate our businesses and jobs and how is this a problem with Waukesha’s independence?</p>	<p>Dan—Yes, it will make those available online. Copies can be picked up at the Water Utility.</p> <p>Dan—I don’t necessarily want to get into specifics of what was in the article. I will get into what may be required of a purchase of City of Milwaukee, Racine, or Oak Creek. In the City of Milwaukee they have passed a resolution with regard to negotiating for water. As part of that resolution what you need to do is provide them some information—a report. The report needs to include several things with regards to the community that is applying for water—issues such as a comprehensive plan that indicates the status of the community’s requirements for the comprehensive planning, comprehensive housing plan, and a public transportation plan. So there’s a report that has to be submitted. Within these requirements you need to sign an intergovernmental agreement that will contain a non-compete clause—it would be something similar to what the counties have entered into with regards to the Milwaukee 7 and that is we are not going to look at obtaining industries in-between counties. For example, Waukesha County is not going to go look to bring a business into Waukesha County unless that business approaches Waukesha. You are not going to go out and aggressively seek bringing businesses. What they are going after here is what you’re looking at bringing jobs from outside of the region, not necessarily transferring them within the region. That’s where the non-compete comes—you are not going after jobs that are already in Milwaukee or in Waukesha. They are talking about a compensation provision similar to the Cleveland Agreement. The resolution says they believe they’re going to lose housing and potential businesses that are associated with providing water, so there would be a compensation agreement that would go along with that. Within the City of Milwaukee their recent agreements have been signed they have had a</p>

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		<p>compensation clause in there. For example, the City of New Berlin paid a \$1.5 million fee associated with being able to obtain the water. We would not be able to determine what a fee or what any conditions would be until we negotiate with the City of Milwaukee, Oak Creek, and Racine. When we seek the Common Council's approval to submit the application, we're seeking the Council's approval to submit the application; we're seeking the Council's approval to begin that negotiation process. That negotiation would be lead by Lori Luther and me in terms of negotiating those contracts. We would negotiate the contracts. If there were provisions that were within those contracts that wanted to try to limit our development or put transportation impacts on us or some requirements on us, that would have come before the Common Council for approval. I believe the Common Council has stated that they are not interested in signing an agreement that has any of those clauses that are associated with it. We would then look at other alternatives. If we could not develop a reasonable contract with the City of Milwaukee, Oak Creek, or Racine, we would be looking at developing one of the other alternatives we have. Lori—There are 2 separate, but related issues. 1. The application for Lake Michigan Water. 2. The City's pursuit of an agreement with one of the providers. That contractual agreement must be negotiated and must be approved by the Council as Dan has very precisely laid out. The first step in the process is this application to receive permission to even pursue that type of agreement. I think it's important to understand that this is a multi-step process and the first decision for the Council is approval of that application and the second step is the negotiation of the specific agreement with the provider. I can assure you, no agreement that is negotiated will be brought before this council if it does anything to endanger our sovereignty or independence.</p>

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Question by:	Question	Answer
Bill Boyle 1609 Rockridge Way	I'm a new resident to Waukesha ~ 2 years. I work for Envirex. Obviously, politics is the big Kahuna on this one. I commend you for all the work you've done—excellent engineering report and details. I lived in Milwaukee for 35 years and moved out here. We have to watch out for Milwaukee. The water reuse from the affluent instead of using the renewable source. To what depth did you look into this? The perception Milwaukee gives you is probably as odorous as drinking affluent. I'd like to see a look at the water reuse for water make-up, if anything. Do you have to pay back grant funding? Alternates all look really good—one thing with Oak Creek and Racine, they use a filtration—membranes. Did we look at that here in Waukesha?	Dan W. —Grant funds are gifts. Dan —We have looked at water reuse. With regards to membranes in Waukesha, as part of our plan for the combination of deep and shallow aquifer water, we do have in the plan to install membrane filtration on our deep aquifer wells to eliminate the total dissolved solids that are in that. We have it projected it out in the year 2020 to start installation of membrane technology in our deep aquifer wells. I would be more than happy to meet with you to discuss the reuse in the future.
Steve Edlin 426 Prospect	If you thought your tax bill jumped a lot this year—there's big surprises coming from the school district—I'm running for the school board. This is just another reason why we have to be concerned about our future in Waukesha and our affordability to live her. There's an underlying issue that makes me uncomfortable about this whole process—politics. It extends beyond being compliant with the EPA in reducing our radium level. I put this akin to regional cooperation and Miller Park and a politician of George Petak. When we're looking at the aquifer that we're currently reducing, I spoke to Rep. Kramer 2 years ago and asked why we're going after Milwaukee water and his explanation at that time was we're drawing down on the aquifer and it's going to have a regional impact. Sounds to me like this is an issue that extends beyond Waukesha's	No Comment.

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	<p>borders. If we're going to have an issue that we're pursuing Lake Michigan water, and we're expected to pick-up the entire tab for this pipeline, to benefit the communities around us as the aquifer recharges that we're the ones on the short end of the stick. If this is regional cooperation, we're the ones that are having to foot the entire bill for the region. I don't mean further west, I spoke with Dan tonight about where the aquifer extends—primarily eastern Waukesha county. We've got a huge lobbying group right now in Milwaukee that involves substantial large businesses that want the pipeline to go to Lake Michigan. Why are they getting involved in this? We have SEWRPC overshadowing us and dictating to us because they can—they draw up the water boundaries, and they want us to get Lake Michigan water, and yet we're paying for it. This isn't regional cooperation - regional cooperation involves if you want us to do this route, then you should help us because our property tax bills are going to go through the roof in the next couple of years. When your water bill doubles, you're going to have a hard time trying not only businesses, but people to the City of Waukesha. You may seen an erosion of the tax base. I would say that no business that's going to be involved in any quantity of water is going to move here. There's a lot of considerations that are extending just the radium issue. There should be help.</p>	

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Charlene Lemoine 1240 High Pointe Lane	Average household quarterly cost—you do have some projections without assistance, but what about projections for overages—it seems like most large municipal projects come in way over what they originally expect and how are you going to be dealing with that type of situation as far as property taxes and paying for the project. If we do acquire Lake Michigan water, is the city going to continue to pursue conservation—I really think we need to do more in that area and if we did get Lake Michigan water, I would not want the residents of Waukesha to think they don't have to conserve water any more.	Dan —With regards to the question of overages, there is a 25% contingency that's built in to those numbers. I agree with you, it's very difficult to determine what you're going to run into and start to construct that pipeline or build that project—we do have a contingency built into all of the options that are there. Regarding the conservation, yes, the City does understand that conservation is a part of any solution of any resolution to the water supply issue. We'll continue to implement that water conservation plan. The Water Utility Commission, as well as the Common Council has determined it is going to implement that plan and the Common Council and Water Commission have taken steps to implement that plan. There are short, mid, and long-term goals that we're looking at implementing and we're going to continue down that path.
Terry Griffie 3414 Turnberry Oak Drive	I'm concerned about the baseline of the assumption regarding the population growth and the continued expanding of the city boundaries. You sited that you have 31% reduction in the water use with 18% growth. I think you would have had 47% reduction without the growth. I really wonder if you considered how you meet the radium problem with a baseline of the current population, because I don't see a reason to keep expanding and the real need for growth. I don't believe the SEWRPC numbers for growth.	Dan —State law requires us to determine what our water service area is going to be. It also requires us to accommodate growth—that's the state law that was within the implementation legislation for the Great Lakes Compact. We looked to SEWRPC as the regional body which is given the authority under the state statutes and we looked at the regional body to determine what our service area would be. SEWRPC went and determined what that service area is and did projections of what the population will be within that service area. That service area is intended to grow from the current of ~70,000 people to ~97,000. Over the length of this project period, that's less than 1% of growth. It's a reasonable growth and the compact and legislation requires us to accommodate growth. So that's what we did within our projections and that's what we looked at in terms of our future water supply in terms of how much volume of water we're going to need. Under all the alternatives, we're looking at the same volume of water which is 18.5 million/day. Under all the alternatives we looked at, previously we were

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		requesting between 22 and 24 million gallons/day because of what our projections were terms of water use. That was prior to us implementing a conservation and protection plan. Now that we've implemented that plan, we've had success over the last years. We've seen that success. We're comfortable in asking for a lower volume 18.5 mgd and we'd be able to accommodate that growth within 18.5 mgd. That conservation program will play a role in servicing our customers in the future.
David White 214 Mandan Drive	I applaud the Utility for its detailed studies that they've done on the water supply issue and I believe they're pursuing the best long-term solution. One question that I have—is the debt that has to be taken down for these future capital projects, is that proposed be paid back by the general city tax or is that going to be part of the rate structure of the Utility, because those two are separate items.	Dan —There would be revenue bonds taken out by the City and the payback of those bonds would be undertaken by the rate payers of the Waukesha Water Utility. They would be paid back through the rates. The payback for that bonding issue—we've assumed bonds of the \$164 - \$174 million estimates that I had out there and those bonds would be paid back over a 35 year period and I believe around a 5% interest rate. That's incorporated into the rates that I projected for the public. That will be available on the website. It will not be on the tax bill.
Steve Edlin 426 Prospect	If it is on the property tax bill, would we not be able to deduct it on our Federal Income Taxes. We do extend the water boundary beyond the City of Waukesha, so the Water Utility would have the jurisdiction, but from a tax-payers standpoint, we've just gotten crazy on fees. There are so many fees attached to the City of Milwaukee water bills and that's how they are getting around revenue limits—they're shedding things like garbage collection and putting it on your water bill.	Dan —It is not being proposed to be on the tax bill right now. I'm not a tax account so I cannot answer the question of whether it will be deductible or not. Lori - It appears to me that there is some confusion on this topic. The funding of the pipeline—the projections you saw in the presentation prior to the question/answer period. The bonds would be revenue bonds—they are issued by the city, but all of the debt service payments are repaid from the revenues from the Water Utility. Your water rate you pay on your quarterly bill is what pays off the debt. The cost of this project will not be appearing on your property tax bill. The cost of the project and your contribution to it and your contribution to it will be on your Water Utility bill.

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Mary Kost 2084 Highfield	<p>To our point, it really is about Symantec's. Whether I see it on my property tax or on my water bill, I'm going to see it from the way you guys are approaching this. Dan the last time you saw me in front of you, I know we had a discussion and you deeply apologized for your lack of communication in telling anyone we were going to have a water tower right in our backyard. When you think about using Milwaukee water, I'd like you to think of a couple of things—problems they have with their deep tunnel project that's still are failed, their line breaks that just recently a week ago cost the City of South Milwaukee to have unusable water. If you are looking at that as your only supply, that's a concern for me. I've now lived in Waukesha 22 years. When I came here in 1988, I got a piece of paper from the Water Utility that said the EPA said they ___the wells of radium. It implied that you didn't trust your water source—when you didn't, I didn't. So I purchased a real fancy RO system. When you did the pump deal on the water tower, I bought my own pump so I can now pump water into my house to get a shower. Have I taken care of my own problem with thousands of dollars? You bet. It's important to me. I'm here for the other people that didn't have the money to spend on their own RO filtration system to try to reduce radium, etc. Think about the quality of the water and going back to my initial point, when you apologize for your lack of communication in the last 2 years - a section in the Journal and Freeman for everyone to see the Water Utility to tell people what's really happening with the water and I mean</p>	<p>Dan—With regards to the City of South Milwaukee, it is not provided by the City of Milwaukee water. They have their own filtration plant to provide their own water.</p> <p>Dan—Mary, I would be more than willing with you and discuss the communication at any time after this meeting or you can call and we'll set up a meeting.</p>

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	<p>honest communication, Dan. The lack of communication to me is appalling. I could appreciate if someone from the Water Utility would please tell me when the other tower is going to be removed like 2 years ago you said you'd be taken that one down because it didn't properly function. I have right here your radium compliance tasks—report page 1 and page 2—I've got all of your stuff—your Consumer Report from 2002–2009—they barely changed, I would appreciate a community to look outside their boundaries to figure out—maybe we need a broader committee, maybe we need new faces, new people that can do some other research on other ways to find the water sources that might be beneficial for our community. Clean water supply affects our population and our people—the colon cancers and other cancers and things that come with it and I agree that we need to find another clean water source. For the lack of communication that's so appalling to me that I can no longer can even tolerate, I would appreciate some new faces that could be a voice to our community.</p>	
<p>Jeff Scrima 125 N. Greenfield</p>	<p>Just want to make one thing clear—we are capable of removing radium from our water—matter of fact we're doing that on 2 of our deep wells right now. We can remove radium if we want to. I don't think it's so much about radium and the 2018 deadline. Also, in researching this I came across the 2002 Future Water Supply Study and right on the first page of the Executive Summary it says "the current water supply situation is not critical". This is a very exhaustive study done in 2002, which you base a lot of your work</p>	<p>Dan—I've been here for 8 years now and we have been studying for those 8 years and we have been studying it methodically moving along that dual path that I outlined for the Common Council and the Water Commission in studying these options. The most important point here is everyone needs to understand we need to do something. We can't do nothing! If we don't go with the Great Lakes supply option it's going to cost \$171 or \$174 million. Those are the groundwater options. Is there water left in the deep aquifer? Yes, there is. Is there water in the shallow aquifer? Yes, there is. That's why those are 2 of</p>

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	<p>upon. It also shows a graph of how the water has been drawn down since the 1950's. Based upon what it says, we have approximately 100 years left of water right underneath us. I find that rather interesting. I've been trying to figure out what's the big push for hooking up to Milwaukee—why is this happening all of a sudden? I went to a water luncheon summit yesterday sponsored by the Sustainable Water Supply Coalition, which is a lobbying group, also sponsored by Metropolitan Milwaukee Association of Chamber and this meeting was held in Milwaukee, for the express purpose of hooking Waukesha up to Milwaukee water. There were about 90 people there—there were only 4 representatives from the City of Waukesha—myself, Mayor Nelson, Dan Duchniak and Steve Crandell. Listening to these great speakers, Richard Muson, Dale Shaver, John Austin, Peter Anin, came to a conclusion—they handed out a sheet there that says “in the end, Waukesha's need for water will come at a cost which could provide a nice revenue alternative for fiscally challenged Lake Michigan bordering communities.” Also, part of this event, was our very own Waukesha county, and the county appears to be giving us the nod to go ahead to Lake Michigan because it will preserve more water for the rest of the county. You are apparently going to be applying for some federal grants through the Army Corps of Engineers. You don't know how much grant money you are going to get—it's between \$15 and \$100 million—that's a big range and will affect the people of Waukesha's water bills. That grant goes to the region—it goes to Milwaukee and Waukesha</p>	<p>the alternatives that are being analyzed and 2 of the alternatives that we looked at within our study. We have the combination of the deep and shallow aquifer, we have the combination of the shallow and Fox River alluvium, and then we have the Great Lakes supply option. There is going to be an expense because we need to come into compliance with the radium standards. We're under a Court Order to come into compliance with those standards by 2018. We could put in radium treatment at some of our other wells and we have looked at that. We wanted to minimize the amount of treatment in our deep aquifer wells because of the fact that we know those aren't sustainable for the long-term. We've seen that there's radium issues, we've seen that there's total dissolved solids issues and there's other issues that come up with that and temperature issues. We've seen that there's a number of things that are associated with the water quality that's coming from those deep aquifer wells, which is why we need to limit or get off of those deep aquifer wells. With regards to the federal funding and the grant and Milwaukee having a say—all of Congress is going to say as to whether we are allowed to getting that grant. Right now we're working with Senator Kohl and Congressman Sensenbrenner. But all the Congressman and Senators will be voting on that grant. The grant we are proposing looking at right now is for Waukesha and Milwaukee counties because that is where approximately 30% of population lives. We're applying for a \$100 million grant that is going to be for Milwaukee/Waukesha counties. Will we get all of that money? I don't think so and I've never said that we would. When I've talked to people out there, I believe we could potentially get between \$25 and \$50 million from the federal funds for that grant to offset some of our capital costs. Will Milwaukee have potential to get some of that funding? Absolutely. That's something because it's for Milwaukee and</p>

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	<p>county and Milwaukee has a say if we get that grant money. So what do you think is going to happen if Milwaukee gives us the okay to get between \$15 and \$100 million and we have to negotiate a water deal with them, they're going to say—it's tough to get this free money. Pony up. That's how business negotiations work. Milwaukee is also requiring economic compensation to hook up to them as Dan mentioned for potentially lost businesses or jobs. We don't know what that compensation amount is going to be. They may want \$10 million—they may want \$80 million—we don't know. Why are we going down this path so hard and fast when there are such huge questions that have yet to be answered and we're not going run out of water because your 2002 report said that and we can remove radium because we're already doing it on 2 of our deep wells. Also, if it turns out that some day we have to hook up to Milwaukee for a water source—why doesn't Milwaukee provide us a letter from their Mayor and their Council saying—you know what Waukesha, this is only about water. We want you to feel comfortable about proceeding with this—we're going to issue you a letter that says this is just about water. This is not about economic compensation, it's not about charging you more, and it's not about housing, transportation—anything else. I would like to have that letter from Milwaukee now before we move further. Also, we can go to Oak Creek or Racine, if they want to sell us water some day, then maybe they can help pay for the cost of the pipe. We know going to Oak Creek or Racine is going to cost substantially more because of</p>	<p>Waukesha Counties, they would eligible for some of that funding also.</p> <p>The economic compensation piece of it, that is something that is part of negotiations and I don't necessarily want to discuss that here. That will be part of the negotiations and I'm not at liberty to negotiate within the public. But, as Lori Luther pointed out, I don't think this Common Council is going to approve a contract that will have an impact on our sovereignty or cost us too much financially.</p> <p>Why are we moving so hard and so fast? I would argue just the opposite. We've been working on this for 8 years, moving slowly and methodically through that process. We've outlined this dual approach with groundwater and lake water—we want to move now to apply for Great Lakes water so we can begin those negotiations and when we begin those negotiations we'll know what that final contract says. When we know what that final contract says and we know what the land is going to cost us, we doing our cost benefit analysis like we always said we were going to do, then we come back to this Common Council for a decision point. This Common Council will decide whether or not we move forward with the Great Lakes supply or with a different supply. If what Milwaukee is going to put on us with regards to a contract is too significant for this Common Council, I don't think this Common Council will be one to write off on it or accept those negotiations.</p> <p>With regards to Oak Creek and Racine—that is a good point. We will talk to them about that.</p> <p>With regards to compensation from the county, I would say that the Water Utility is open to any funding that is available – whether it's federal, state, or county funding. Anything we can do to minimize the cost to our rate payers is a benefit to the residents of the City of Waukesha.</p>

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	<p>the distance. Maybe they could come forward now and tell us they'll help us with the cost of the pipe. That be nice on their part so I hope they're listening. Also, as mentioned earlier, if the county want us to hook-up, then perhaps they should offer some economic compensation to us. That's regional cooperation. I'm confident that we need to slow down and continue to explore all options. We need to have more open dialog. We need more transparency, and we certainly need to let the people that live in this City know what's going on.</p>	
<p>John Holst 2051 Highland Ave</p>	<p>If the only problem with our water is the radium, you can install a filter in your home to take this out. Why doesn't the Water Utility filter that out? What is the cost and can this assistance be applied to this? You do it in your house, so why is it not being filtered out before it comes to our house? If it can be, will the cost that you have here on this sheet be applied to this?</p> <p>If this is possible to remove this, this money that's going to be handed down to us from federal or county, could that be applied to removing the radium?</p> <p>So what you are saying to me is that it is possible for the water company to remove this radium before we get it at our house.</p>	<p>Dan—The costs that are associated with a deep aquifer option and the shallow aquifer option include radium removal and they also include reverse osmosis to be installed at some point in the future about the year 2020 to eliminate the total dissolved solids that we are projecting that will be in that water supply also. So, yes we can remove that radium.</p> <p>With regards to putting a fixture in your house. I don't know if you are looking at water softeners or a reverse osmosis system within your house that removes it at your tap. The issue with that is that the state will not allow us to utilize a water softener or a reverse osmosis system at your tap for water compliance. The only way they would allow that is if we would be responsible for maintaining those water softeners. So we'd have to be responsible for maintaining the water softeners or the reverse osmosis system within every individual household and guarantee that they are working. The other issue with regards to water softening is that when you soften water, typically, the cold water that is at your kitchen sink is not softened water. It's hard water and bypasses your water softener. That's the water that's used most for consumption within your home would not be softened and would not have the radium removed.</p>

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		<p>That is what we're showing in terms of the rates that the deep and aquifer shallow option has the radium removal in it and in that matrix that I believe Alderman Pieper and Commission President Warren asked me to put together, that's where that matrix where we show the different levels of federal funding apply to each one of those projects. Whether it's the radium removal project and the deep and shallow aquifer option, or whether it's the Great Lakes option, the federal funding is shown being utilized for either one of those options.</p> <p>Dan W.—From an education standpoint, the Water Utility has spent approximately \$13 million over the last 4 or 5 years to drill some shallow wells and to install exactly what you're asking about—radium removal equipment at a number of our wells. Some of the water that our residents are currently drinking right now is filtering out the radium using a type of equipment installed at the source before it goes into the main and is distributed to our customers.</p>
Steve Edlin 426 Prospect	<p>On the grant proposals, there seems to be a splitting between the grant funding between Milwaukee county and the City of Waukesha. All of the things I've seen here tonight or read in the past are strictly engineered with the option of Lake Michigan water through Milwaukee. I haven't seen anything that's geared towards Racine or Oak Creek in an engineered plan or costed out plan and so we're boxing ourselves in. If we are making one grant application that is strictly for Milwaukee county and the City of Waukesha and not extending the same grant opportunities to those other 2 communities, are we holding leverage over the councils head in saying that if you don't take this option, we're going to lose federal grant money.</p>	<p>Dan - The grant money would be available to any community within Milwaukee and Waukesha county, so it would be available to Oak Creek. Racine County is not included in the area that we're looking at right now, so it would not be available to the Racine option. We are looking at the numbers with regards to Oak Creek and Racine. The reason that Milwaukee has the more in-depth analysis is because we start out at the 10,000 foot level and we start looking at what the costs are going to be and then we looked at the infrastructure that it would take to get to Racine and Oak Creek and because the infrastructure to get to Milwaukee is cheapest, we get into the details of that option the most. It doesn't necessarily mean they ruled out, it just means the infrastructure cost is more expensive so it would come down to negotiations and what the infrastructure we would have to pay for and what the cost would be to obtain those supplies.</p>

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<p>Jim Bouman 1909 Easy Street</p>	<p>We can't do nothing. We have to do something. I think it's important from a historical understanding for a lot of people that haven't been around here for the last 20 or 21 years. This Water Utility Commission did a lot of nothing for a long time. Now we hear we need to get you safe water. Well, we heard back then and not that long ago, was our water is perfectly fine, it's safe. The Mayor would gone on and on about I've drank this water for all my life and I don't have any cancer. I think that an awful lot of delay, an awful lot of denial. They went to the first Bush administration and tried to get the EPA to throw out the radium standard, and then they went to the Clinton administration, when they had no success with the republicans and didn't get any satisfaction and then they went to another Bush administration for the same ultimately. Went to the Supreme Court of the United States trying to assert that we don't have a problem here. Now we're kind of rushed. I think part of the problem is the lack of perspective by the Water Utility Commission. An earlier speaker was complaining about poor communication. In one respect I have to agree with her, way to many of the decisions of the Commission lead up to what we have here today and what was just released month—6 weeks was done behind closed doors. Over the last 4 ½ years I've attended several dozen Water Utility Commission meetings and I've really been able to educate myself about issues. One issue I'm really concerned about is the PILOT. The PSC requires non-profit utilities to make a payment to city in order to level the playing field. Many utilities are not non-</p>	<p>Lori—In regards to the payment in lieu of taxes, I would like to point out a couple of things. It's incredibly common for a municipality to negotiate a longer term agreement on what the annual payment in lieu taxes is going to be for planning purposes, not solely for the benefit of the Water Utility, but also for the benefit of the city so you can anticipate what that revenue stream is going to be on a yearly basis. The PSC has a formula—you can recalculate what that actual amount would be on annual basis, and that would fluctuate. It has been in the interest, I believe, of the City and the Water Utility to have a longer term perspective on what that amount is going to be and that is how the City has pursued PILOT payment in the past. We have negotiated PILOT payments for the next 10 years, I believe and we are looking at being very close to what the PSC would recommend. I believe that issue has been handled, I understand the concern, but that's a very common practice and that's the rationale for having those longer term agreements so there is knowledge on either side of what those expectations are going to be and what that revenue and expense is each year.</p> <p>Dan - With regards to the replacement program, the Utility Commission does have a plan in place. We have a 5-year Capital Improvement Plan, as well as a 5-year Financial Plan. What the Commission has done is tried to balance those Capital Improvement Plans with the radium compliance and the future water needs. We have looked at that in terms of our 5-Year Financial Plan and our 5-Year CIP and we've had to make some adjustments, make some decisions, and some of those are hard decisions. With regards to the amount of pipe that's being replaced, you are right, Jim, it's not 1% of our system where we would like it to be. We've had to make those decisions to not going that far because of the radium compliance projects. The Utility is on a step plan where we are increasing the length of</p>

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	<p>profit. If non-profit utilities like our water utility are allowed to function to having to pay property taxes. This is not a level of playing field. The PSC builds into the rates a formula for the PILOT. Ms. Luther is talking about the Water Utility as an enterprise of the City. Implication being there that no city taxes go into it, that the funds necessary to run the water utility are derived from the sales of water. The past 10 years the city has been showing forbearance in regard to the payment of PILOT. Major, major deductions from the amount of money that is due in the PILOT have for the past 10 years—the city has said no, the city taxpayers will forego what should be coming to them because of all of this difficulty you have with this water. It isn't all as simple as that. Water Utility Commission policy with regard to maintaining the infrastructure that's here. This is an old City and we've been here a long time. The national standards are that the Water Utility should be replacing 1% of the water mains/year. Every 100 years you've renewed the entire infrastructure under the streets of the City. Several months ago, Nancy Quirk said that in order for us to be doing a 1% plan, we should be replacing 3 miles of water main per year. When asked how much we had done in recent years it averaged 2,250 feet. That's nowhere near a 100 year plan. That means more and more of the 6" pipes that have been there for 70/80/90 years are going to rupture. I think you've been robbing Peter to pay Paul. I think you've been short changing the long-term residents, the long-term rate payers to come up with a plan you're now popping on us. I can</p>	<p>pipe that's being replaced every year by 10% and we're increasing that 10% until we get up to that point where we're at 1% and where we can look at having that 1% replaced so that we are replacing all those things in your system every 100 years. <i>Dan W.</i>—I've had the pleasure of serving on this Commission for 21 years, with regards to secret meetings or holding secret conversations about this particular issue or any other issue that was appropriate in closed sessions under the statutes, that has never occurred. We're very, very careful about that. Secondly, there seems to be an implication that we're rushing to judgment here and we haven't done the studies that are necessary or appropriate. Whether it's the proper maintenance on our lines—other side line issues or this particular issue with regard to Lake Michigan water. I would invite anyone to come to the Water Utility and take a look at something that is very unique in the water industry that has been in place for 15 years in this Water Utility. We have a 5-Year Capital Plan, we have a 5 –Year Financial Plan, we have a 5-Year Maintenance Plan that every year when we pass our budget, we add another year. We don't want our community to have surprises. I would just invite anyone that's listening to this that would have the concern that we're rushing to judgment on some of these things, to take a look at how we operate. Take the same kind of time you took out tonight to either listen to us on the TV or come here tonight and check it out and I think you will see a lot of due diligence.</p>

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	remember as recently as last year that \$75 million. Last week it was \$164 million. Alderman Pieper told me that today Dan was talking about \$164 to \$175 million. We're getting the creep already. I don't trust what this Commission has done. So much of it secretively, and I urge you to be cautious with the taxpayers money and rate payers money.	
Faye Everson W270S3565 Oak Knoll Drive (Town of Waukesha)	I have many comments and I spent a lot of time reading over the draft application. I can remember the promise that this will be the best application for a Lake Michigan diversion. It really isn't, but it could be. I'm going to try to give you some pointers for improving it. I think the use of the word sustainable is not appropriate and it should be stricken - too many places to where it is in the application. Sustainability is something that we do to conserve resources. To say that you're seeking a sustainable water source is backwards. Lake Michigan isn't sustainable. If it was sustainable, why do we have the compact? We certainly wouldn't need a Great Lakes compact if it was truly a sustainable source. The introduction your application says the City of Waukesha is applying for Great Lakes water to secure a sustainable reliable water supply that is protected of public health and provides regional environmental benefits. I think that's a good statement, but strike the word sustainable. I also think the application is really a PR package. I expected to see a lot more technical information, a lot more data, a review of the alternatives, and I look in the appendix and I can see the statements being made.	Dan —Faye, those are excellent comments and I appreciate those and thank you for those. This is a draft application and that's why we're asking for the public input into this and asking for the public to discuss with us all the aspects of the application. I appreciate your comments and we are hoping that it can be the best application so we'll look to address the concerns and comments that you have and see if we can incorporate them within the application.

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	<p>I really think this is a flowery version of an application. On 2 pages there are 5 statements—that Waukesha is first in Wisconsin for doing this and for many things. I don't think you needed an application to see you're first of anything. I'm a regulator. If I'm reading somebody's permit application to do something, I don't want to see that this person is first in this and that...those sorts of things should be stricken from the application. Right away you say you're a historic community, but someone that's going to be approving that application—that is meaningless to someone in Michigan, Ohio, or Indiana reading this application. So I, respectfully, request that all of the flowery language be stricken from this application and you stick to the need, science, and 8 elements that are in the compact for what needs to be in the application. If I were an 8th grade English teach, this would receive a D-. This application also needs to address the precedence issue. Somewhere I read in the SEWRPC Report that there are 20 water supply systems in southeastern Wisconsin that do not comply with the radium standard—don't hold me to that, but I think that's the number. There are 70 in Wisconsin. I think that needs to be addressed in your application. It's the precedence of this application going through and getting accepted. What does that mean to the other communities that are not radium compliant? I know that when they do the environmental impact statement, that will be something that they are looking at. Heads up, put it in your application. I'm concerned about the Underwood Creek as the discharge point for the wastewater. Maybe we'll resolve this later.</p>	

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	<p>Underwood Creek has just been listed -are on the drafted list of 303 D list. That's EPA's fancy term of saying an impaired waterway. We have many impaired waterways in Wisconsin; this one is just about to be listed. When it's listed, then there's developed a TMDL or a plan to improve the water quality in that creek. I think we need to wait to find out what that TMDL plan is going to say so we know that our additional discharge to Underwood Creek wouldn't require more treatment of your wastewater.</p>	
<p>Nancy Gloe 19355 Benington Drive Brookfield</p>	<p>I read through the application and I would like one clarification. Page 3-4 –Even as the City is engaged in the rigorous application for Great Lakes diversion with return flow, it is developing a new 4 mgd shallow aquifer well field to provide firm capacity of radium compliant water. I'm concerned about that 4 mgd well field. The new wells will help the City increase the reliability of its system to meet radium regulations in the short term. In the long term, pumping the shallow aquifer will cause adverse environmental impacts to nearby natural resources. I spoke with a City Engineer and asked him if the City of Waukesha gets their application approved, would that mean an end to pumping the shallow aquifer and particularly this 4 mgd shallow aquifer well that's being developed, and she said yes, the City would not be pumping any more groundwater except as a back-up basis in case there's some failure in the system or some need. I want it to go on the record from you that indeed, if this application is approved; the shallow aquifer wells would only be a back-up well and wouldn't be used on a routine basis.</p>	<p>Dan—The intent of the shallow well development is just that - to serve as a redundant supply in the event there was a catastrophic failure of the pipeline like we had in South Milwaukee. We would have a supply available to our residents in case there was a fire or something else that would occur that we'd be able to supply a potable supply of water to them. The intent would be not to use them unless we were under one of those circumstances.</p>

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<p>Allen Stasiewski S52W26415 Foxvale Court</p>	<p>President of “Friends of the Vernon Marsh”—a new organization dedicated to protecting the Vernon Marsh in Waukesha County. Our Board is concerned that the City continues to plan to build new shallow water wells in environmentally sensitive areas next to the Vernon Marsh, particularly the Lathers Property. Those wells may have a negative impact on the marsh eco system, and before these wells are built and put on line that more scientific studies be done so we’re sure they’re not going to impact the Vernon Marsh. We’d also encourage the City, along with its water conservation efforts to look into protection of Waukesha’s shallow water aquifer, as well. The protection of the Vernon Marsh of being that it’s an important resource to the region. My question relates to this—why are new shallow water wells required and the financial impact that they will occur to the residents of the City of Waukesha and what will the City do to ensure that the new shallow water wells on the Lathers property—what will the City do to ensure that those wells will not negatively impact the Vernon Marsh and its aquifer?</p>	<p>Dan - The protection of the Vernon Marsh is important to us also. One of the things we’ve done is worked with the developer and the DNR in regards to our acquisition of the property. On the plan commission or town commission tonight was a CSM to divide the Lathers property so the DNR could acquire ~200 acres out and expand the Vernon Marsh. With that acquisition, the DNR would take part of it, we would acquire the lands for the wells that are necessary and the developer would keep a portion of it for future development at some point in the future. There’s a win/win/win in our minds that the DNR did acquire lands to expand that Vernon Marsh. With regards to wells on the Lathers parcel, there would have to be DNR approval of those wells. Have served on the Groundwater Advisory Committee and looking at the groundwater resource in a groundwater management area, there are going to be studies that will be have to be done and we’re in the process of doing those studies. SEWRPC just completed a model of the Troy bedrock aquifer that is in southern Waukesha County and we’re using that model now to model the installation of those wells and see what the impacts would have so we could look at what the proper run would be for those wells and the proper utilization of that water would be. That is a study that is currently underway.</p>

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Cheryl Nenn Milwaukee River Keeper	<p>The request is if you would be able to put on a line a more specific breakdown of the cost estimates of each of the alternatives, so we know what's in those numbers—we'd have a better idea of what the cost breakdown is for each of those. My questions is—I'm still trying to get my head around the daily demand calculations and how those were determined. For example, the application says that Waukesha is going to increase the daily maximum use of water which is ~9.9 mgd to 18 mgd. We're essentially almost increasing by 100% that water that's asked for. When the population is only expected to increase 25% based on what I read on the report from about 68,000 to 85,800 people between now and 2028. I'm trying to wrap my head around 25% increase in population, 100% asked for increase in water and why that should be the case especially since Waukesha's doing a lot of work—especially in water conservation as well.</p>	<p>Dan - With regards to the request for the cost estimates I will double-check, I believe the cost estimates documentation is online and is available. It's part of the documents that you see sitting in front of you. There's detailed analysis and I believe it goes down to the number of rebar that is in the treatment plant so there's a lot of detail that's in those estimates. Dan W.—We could provide a few more line items that summarizes more detail with regard to that. I think that's something that will be helpful to everyone and we'll take a look at that.</p> <p>Dan—With regards to the daily demand calculations, what we have to look at in terms of the Water Utility and water supply is what that historic demand was and the impact of our conservation program. We also have to be able to supply water to our residential customers, in the event there is an extreme drought. We need to try to project back in 1987 when there was an extreme drought and we did have almost a 16 mgd demand in those times. We need to look at what would happen under the scenario of an extreme drought and the amount of water we would need. When we look at our projections we take that into account and we looked at the service area and the population projections for the service area. We looked at a volume for per resident within that service area and then we created a band, whether a low band with high conservation taking place, and a high band and with regards to the selection of the number that we took—we chose the number that was right in the middle. We believe we will conserve water, we also believe that we need the flexibility of that capacity in the event there was an extreme drought condition and why we knew that we could go from the original projection was of 22 to 24 mgd to that 18.5 mgd projection. The average day demand we did basically the same thing. If you want I can go through those projections with you—we can go through it in more detail offline so you can call me and we can meet.</p>

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<p>Lori Longtine W271S 3581 Oak Knoll Drive (Town of Waukesha)</p>	<p>What is the plan for moving forward from here with the application? We have a March 8th public comment meeting scheduled and then what's happening after that? When will this be brought forward to the Common Council for a vote and what steps will you take to incorporate public comment into either a vision or a new plan after the public comment period is over?</p> <p>Many of you know me as a board member of the Waukesha Environmental Action League (WEAL). I'm simply speaking for myself tonight. I do feel that even though I live in the Town of Waukesha, I am in the water service area. We're one of the areas that's very close to city boundaries now and as city boundaries have rolled out to the west and south, we seem to be getting closer to the city all time. I have nothing against the City. One of the things I do enjoy about living in the town is we pay lower taxes. Now that we're in the town we supply our well water and our own septic system. One of the things that I'm concerned about, is the more of these high-capacity municipal wells go in...all over the landscape, what's that going to do to the water table that's supporting all of these wells. Some people that spoke here tonight have homes right next to the Lathers property and they're very concerned about what's going to happen with their private wells should the city go in there and start pumping out 3–4 mgd. I'm also a taxpayer, even though my town taxes would not be paying for any sort of water diversion plan, I will be paying for it through my federal, state, and possibly my county taxes. When I'm thinking about this whole issue, I'm</p>	<p>Dan - The plan right now is to have this meeting here and take the public comments that we've received and address those within the draft application. On March 8th, the Common Council will have another Committee of the Whole Meeting. They will accept public comment one again with the application. After that public comment period, the Utility Commission, based on the comments that we get and the ability for the staff and consultants to address those comments, the intent is to take that to the next Commission Meeting which is on March 18th, and at that point we would be looking for the Water Commission to make a recommendation to this Common Council to apply for Great Lakes water. The meeting following that would be April 8th and we would look for the Common Council to take that up to submit the application to the DNR. Once that process is complete, that's just the beginning of the process. The DNR will then work with us—there's an environmental report that we're putting together and that will, in turn, be taken by the DNR and made into the environmental impact statement which will then have a number of public hearings that will then have a number of public hearings associated with that.</p> <p>Dan—At the beginning of your comments, Lori, you talked about the private wells that are adjacent to the Lathers. The Commission passed a Resolution said that it would enter well guarantee agreements with regards to wells that may be impacted by the operation of those wells, so I just want to let you know that that Resolution was passed. As I mentioned to Allen, we are doing modeling of that and will be doing modeling of that area to see what the withdrawal would be.</p>

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	<p>starting to get a grasp on what this all about. We are a community that includes the City of Waukesha, Town of Waukesha, and even in some cases the larger county of Waukesha. I think this whole thing boils down to a discussion that really hasn't been had in the open but it's about how do we want to live. What is the vision for our community going forward—however, I guess we really need to think about how it is we want to live. The subdivision east of the Fox River and south of Hwy. 59—River Place—it's in the city, but anybody that goes past it they might think it's in the town. This is what I think we're going to be getting as the city boundaries expand to the south and west and what this is all about that Faye mentioned sustainability and that's a thread that runs throughout your application. Real sustainability would be learning how to live with the resources we have. Even if those resources are radium tainted water, learning how to recycle it and to treat and to conserve so that our growth matches the ability of our resources to keep up. WEAL is often accused of being anti-growth—that's not really true. This growth model that Jim Payne was a big proponent of talking about \$300-\$400,000 homes to support a tax-base that's going to supply the city, as it is now, with its current services. But every time you grow and go farther and farther out—you have to supply those same services. I'm not just talking about water and not just water treatment. There's police, fire, roads, pollution, schools and you have to account for some of that. A lot of people in this economy like living in the suburbs, but they can't afford to live there anymore because of transportation.</p>	

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	<p>We're coming up against a point in our planning/thinking where we are realizing that land, as well as water, is a finite resource. This is a real opportunity for the city to exhibit true leadership and true sustainability by coming up with some really innovative ideas—this city could be a water leader, not as a poster child for getting a Lake Michigan diversion which is an outside of borders solution, to the problem that we have the technology and the leadership that we can solve here within with what we've got. We can't grow any further to the north or east, there's New Berlin, Brookfield and Pewaukee. The only way we can go to grow at all is to go south. I would encourage you to really and truly think about the kinds of decisions you're going to be asked to make very soon. The economic costs and there's the human cost. I think we'd like to live differently going into the future and finding out that this economy which may not recover the way it was—these \$300-\$400,000 homes that are expected to supply the financial resources for the city as it exists are not going to be there and we have to take that into account.</p>	
<p>Duane Paulson 1121 Summit Avenue</p>	<p>I would like to commend the Commission for listening to all of this and I would like to know what the alternative is. I guess each one that comes up in the future on this; first of all, do you admit there's a deadline to meet? Other alternatives based on science and engineering, I would like to hear them. I've heard what they don't want, but I haven't heard what they do want. I appreciate your taking all this guff.</p>	

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Alderman Peggy Bull	<p>There was just a couple of things I want to mention—as the aquifers get deeper and deeper, it costs more money to bring the money up from that far in the ground and that the cone of depression goes from maybe north of us all the way down to Illinois? So, the recharge that would happen from us stopping pumping, I don't think it's going to be dramatic as long as this whole area keeps pumping. It will recharge. As far as conservation, when we get the new water rates, will there be conservation rates, in other words if I don't like my water bill, maybe it's time for me to replace that toilet and take shorter showers? When something becomes more expensive we tend to spend less of it and nothing get people's attention like their pocketbook.</p>	<p>Dan - It's all in southeastern Wisconsin and Northeastern Illinois. There will be some recharge, but in order for the entire aquifer to recharge, everyone in southeastern Wisconsin and northeastern Illinois would have to get off the deep aquifer—correct. We currently have inclining rate blocks structures and over the next several rate cases that we have, we would expect to increase the difference in cost from those rate blocks and maybe even shorten those rate blocks. Those are things we are looking at with the PSC as to how we can have those rates impact conservation, however, that is not the only component to conservation and there are a number of other things that we are looking at doing.</p>
Joe Pieper	<p>Thank the members of the public that came out tonight to ask questions and those watching at home and thank the Water Utility for taking the questions. Also, to remind folks that all 15 alderpeople have reams of information on this issue and if you're sitting at home tonight and have a specific question about something and it hasn't been addressed or you didn't hear it, please call one of us. It's our job to come to your house and explain this issue so you understand it and make sure all of your questions have been answered and addressed.</p>	<p>Dan—It was with regard to the water supply not running out. That is correct—the water supply is not running out—the aquifer is not drying up. The issue is that there's quality issues associated with the water as you get deeper and deeper. Like Alderman Bull pointed out, it's more expensive to pull that water up and then we have the radium issue, as well as the total dissolved solids issues. It's not radium compliant or sustainable for long-term because it's getting more and more brackish and as you have to treat that, it becomes more and more costly, and also when you have to treat for total dissolved solids, that requires membrane technology that was discussed earlier—with that membrane technology there's also a waste of 30% of the water—so you have to pump 30% more to achieve the same volume.</p>

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Alderman Paul Ybarra	<p>I'd like to echo what Alderman Pieper said. It's important. I joined the council approximately 4 years ago and I've spent a tremendous amount of time researching and interviewing Dan Duchniak, understanding what's going on, reading the reams of notebooks that we seem to get on this topic. It's important and these types of sessions are very important. I commend all the citizens whether they are City of Waukesha residents or not for taking time out of your busy schedule and educating yourself. It's a very important topic for the City of Waukesha. I'm very impressed that so many of the speakers are citing all of the information verbatim so it shows they've invested time. I would invite anyone in District 5 to call me on this. There was one question about the 2002 Executive Summary—discussions about something not being critical. We have a water supply; it's just not a radium compliant water supply? I continually hear something about sovereignty and that Milwaukee is going to dictate to us. It's obviously that kind of a statement that's a concern to every resident. Lori, I heard you make a comment that you were not going to be bringing any agreement in front of this council for me and my peers to vote if it has anything to do with limiting our sovereignty.</p> <p>So, just one more time, you will not bring an agreement to council for us to vote on that limits our sovereignty.</p> <p>Dan, how long have we been studying the water? So an intensive study for 8—9 years on this topic, another outside organization without 38 experts</p>	<p>Lori—You are absolutely correct in that statement. Certainly, any process in negotiation with any of the providers are going to be within the parameters that are approved by the council. Just like I negotiate any contract or labor agreement. The Council sets the parameters within which we negotiate. We are certainly not going to place ourselves in a position where we are putting at risk any of these kinds of protected issues. I really take exception to the thought that I would permit such a thing to happen or that Dan Duchniak, as the Water Utility Manager, would do so. Clearly, we will protect the interest of this community and first of all, I would not expect to have the range of issues that I'm permitted to negotiate on behalf of this council to enter into any of those areas nor would I bring forth a contract for the council to ratify if it held any of those items within it. It's very clear to me that Milwaukee will make demands, but that does not mean the City of Waukesha has to accept them. A negotiation is not a one-way street. It is not for one community or any of the providers to dictate the terms upon which we will agree. I think it's very important to remember that. There are 2 parties to any of these agreements and I believe we will be seeking an agreement with all 3 of the providers so that we can come up with a scenario that is the most advantageous to this community. We will be pursuing all of our alternatives in order to make sure we are getting the best deal possible. I can assure you with as much vehemence—I will not bring forth a contract with any of the providers that in anyway limits the sovereignty or independence of this community.</p> <p>Dan - The Future Water Supply Study was completed in 2002, and I believe it took about a year to complete. Other than the Waukesha Water Utility studying it and moving along this path, SEWRPC has also studied this issue for over 3 years and spent</p>

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	<p>studying for the last 3 years? Is it safe to say we're not rushing into this? 9 years of studying this, I don't understand how this is rushing? Do you think we have thoroughly looked at a lot of alternatives? As many as the experts can provide? Mayoral Candidate Scrima had discussed a 3 prong approach—sounds very interesting—did we run any kind of Performa's on what they may cost? Do we have costs—long term sustainable drinking water, but do we have costs?</p> <p>So the Capital costs kind of throw it through the roof because its 3 separate facilities that need to be traded to funnel water through each one of those options. Could I get those—I'd like to look at that. Please provide to the Council, as well as the public, and online—I think it's important to allow anyone who has any questions, to review it.</p>	<p>millions of dollars studying this issue with, I believe, it's 38 of the regions experts, sitting around the table reviewing their work and they came to the same conclusion that we have that the best environmental option for the City of Waukesha would be a Great Lakes supply. Again, that is whether we can obtain that supply under the conditions that are acceptable to this Council. Part of the application process is for us to look at all of the alternatives, which is what we did. As far as I know, we've been studying it since 2001, but it may have gone back even farther than that.</p> <p>Dan W. - The Water Utility has actually been looking at water supply issues for over two decades—to varying degrees of detail. What really triggered more detailed analysis was once the radium standard was set. We then began studies for compliance and alternatives for compliance and began a lot of discussions with the DNR and in terms of the most active period of time, it would be fair to say that the 2002 study really began the period of time here close to 8/9 years now, where there's been a lot of intensive study.</p> <p>I agree with you, because I've been living with this for a period of time also. I do respect individual's perspective—rushing to one person is too slow for another person. I personally respect the comments, but most people's comments would be that we have been studying this for a considerable period of times.</p> <p>In my opinion, simply "yes".</p> <p>Dan - Yes, based inquiries that we've had—we've looked at a pronged approach that he had outlined in an article would be. We looked at the quarry option in conjunction with the deep aquifer option, shallow aquifer option, and Fox River alluvium option. We have done some estimates of what the costs would be; I've asked the consultants to do that for us. At this point what we did is projected that those costs would be approximately \$40 million above what the Great Lakes option would—About \$203 million to</p>

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		<p>go with that pronged approach. The reason it gets more expensive is because you have to install treatment facilities for the quarry, the shallow aquifer and the deep aquifer and one thing I'd like to point out, because of those numbers we did not go into the operations and maintenance of those facilities—we did not get into that much detail because of the capital costs and the number of facilities we would have. We didn't project out what those costs for the operations and maintenance would be because we had eliminated that option for a potential water source. It's not just capital costs, it's the combination of both because they have the capital costs and then you'll have treatment plants associated with 3 or 4 different water supplies and those are facilities you would need to operate and maintain. Now we wouldn't have staff for the two supplies, we'd have staff for the 3 supplies and we'd have to operate and maintain those facilities.</p>
Alderman Charles Lichtie	<p>I'd like to thank everyone for coming tonight. It's been very interesting and insightful. I think it's one of the best public hearings I've ever been at and I jotted down a lot of comments/notes. I take all of these things very seriously. Alderman Ybarra summed up everything I wanted to say—I'm glad Paul made it very clear and Lori made it very clear, because that's the one question I have in my area and that's our sovereignty being compromised and I've told them that speaking as this alderman, I would never vote if it came up to compromise Waukesha' sovereignty in any way, shape, or form by going through Milwaukee for water. I was glad to hear Lori say it twice.</p>	

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Alderman Peggy Bull	One more emphasis from the City Administrator—for instance when you are playing poker you don't show your hand and when you're in negotiations in a public meeting like this, please explain the necessity of keeping some of those things quiet until a certain point.	<i>Lori</i> - I think what you are getting at is the fact that we have 2 separate issues here. We have the application and then we have the issue of the negotiations with the provider. There is a great deal of discussion with Milwaukee, understandably so, because on the face they are the least expensive option. But, as I mentioned, I would anticipate actively negotiating with all 3 of the potential provides to seek the most advantageous packet for the City of Waukesha. Clearly it would not be advantageous to discuss any particular strategy or any particular specifics around the negotiations and open forum. Those have to be done with the direction of the Council and would happen after the main application is approved. I would anticipate that the Common Council would be going into the closed session to discuss negotiating strategy after an application is approved, after which point in time we would begin formal negotiations with the providers. Please understand, that in our attempt to be very transparent and all of this processed, there are aspects that must be kept confidential that are allowed by law and when we get to that point in time when we are actively negotiating, we will come back and have a proposal for the council to review and any final approval would happen in open session with all the terms being open and available for the public to review.

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Dan Duchniak—The comments you are making tonight will be incorporated into our application. We're also having a legal review of the document and incorporating some legal comments into that document. One other aspect that we are doing is some groundwater modeling. SEWRPC recently finished the modeling of the Troy Bedrock Valley. That model was paid for a quarter by the Waukesha Water Utility and by three other communities. There were 4 communities that went in and modeled the Troy Bedrock Valley, which is the aquifer that's south of the City of Waukesha. That model was transferred over to us at the end of January. We are in the process of doing some modeling with regards to the shallow aquifer options, both in the shallow deep option and the shallow Fox River alluvium option and that will also be incorporated into the application. It's important to know that on February 5, 2010 the DNR officially announced its scoping process to support their WEPA (Wisconsin Environmental Policy Act) review. Public comments and scoping is an important part of that review. As it is the public's opportunity to comment on issues that should be addressed. I'm encouraging everyone to submit comments either verbally or written so they can be incorporated into the City's application and they will also be reviewed by the DNR as they fulfill their obligations under the WEPA process. We also anticipate that this project may obtain some federal funding. Because of that, this project must comply with the federal and environmental laws and regulations such as NEPA (National Environmental Policy Act) and the meeting held this evening, as well as the DNR process will become of the NEPA process. If any federal agencies are involved, we are looking at fulfilling that process also.

Mayor Nelson—Our next step will be Thursday, March 18th, we'll have our regularly scheduled Waukesha Water Utility Commission Meeting, but because of the interest on this possible Great Lakes Water Application, we'll be meeting in the Council Chambers instead of the Water Utility. The meeting will start at 6:00 p.m. and all members of the Common Council and all members of the public are welcome to attend. Tentatively, we are planning to ask the Water Utility Commission to make a recommendation to the Waukesha Common Council on whether or not this draft application should go forward. We will be accepting the written comments that Dan just talked about through Friday, March 26th, and then tentatively we're looking at the next Council Meeting after that, which would be Thursday, April 8th, 7:30 p.m., in the Council Chambers to ask the Council to decide whether or not to move forward with this draft application. If that would happen and get a positive vote, that would start the 90 day process with the WDNR where they will hold some public hearings and meetings and our application will continue to be modified and deal with comments in that process.

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<i>Audience Questions/Comments</i>		
John Holst 2051 Highland Ave.	This isn't about the application, I asked this question last week, Dan, and I'm going to ask it again. Why can't we filter the radium out of the water as the water is now? Why can't that be done rather than applying for water from Lake Michigan? I asked that question last week and you said your answer that your water softeners at home—they do not filter it, but there are filters and we have filters working right now that filter the radium out. Why can't we do that?	
Steve Edlin 426 Prospect Avenue	In relation to the expansion of the boundaries of the Waukesha Water Utility, I have 2 questions: 1. The statistics that were put out there for the expansion of the boundaries of the Water Utility claim that in the year 2028 the City of Waukesha is going to experience an increase in population combined with the other areas that will increase approximately from now to 65,700 in Waukesha up to 74,500 by 2028 and the new inclusion areas will go from 9,800 to 13,030, which gives us a total increase of 10,300 people—however, the projected water usage on a peak day is expected to double. I'm concerned because just like the price of gas going to \$4/gallon, I would expect people to conserve water, along with what we've told everybody with our conservation efforts that we will conserve water. So, I'd like to know how we came up with a doubling of our water consumption if our population is growing ~10% over that time period. 2. We've expanded	

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	<p>now into the Town of Genesee, the Town of Pewaukee, the Town of Waukesha, but they have no representation on the Waukesha Water Board. I talked to Willie Hines office and asked him they will require them to comply with the city's housing mix requirements as of Resolution 091017, which will require the City of Waukesha to comply and the City of Waukesha has submitted their housing mix that the Plan Commission came up with. However, these other communities, according to Mr. Hines office, will also need to submit their housing mix requirements because they will be included in our water service area which would receive Lake Michigan water. I want to know if these other communities have been informed that they have to submit their housing mix—I read in the paper one of the community's wasn't even aware that they're in the area now. Have we made an awareness to these communities that are now in our water service area that they are now included in this process, but yet they don't have any representation?</p>	
<p>Charlene LaMoine 1240 Highpoint Lane</p>	<p>I've heard a lot of different figures being bantered about with regard to how much the different options are going to cost and I do have a question—I'd like to know how much you've already spent. We've heard that this has been studied for 20 years, have you got an accounting for what has been spent over this 20 years including the lawsuit for the radium? I think the taxpayers would like to know what's been spent.</p>	

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Jean Tortomasi 2827 Minot Lane	<p>First of all, I want to thank you for making this forum available so people can come and start to be better informed on what our water situation really is. I've had the opportunity to serve on various boards and commissions for this city for going on 30 years and I've always been very interested in what's happening in the city. I've been aware of our radium issue for about 18 years and I know the City Attorney has spent a long, long time trying to negotiate with the DNR to get them to change its standard of Pico curies and the rulings came down against Waukesha. The City Attorney appealed those rulings on up the ladder to the Federal Court of Appeals and, again, we lost. Now we have a radium compliance mandate June 2018.</p> <p>Another issue facing us is a long-term sustainable water source and the key word here is sustainable. Both problems need to be resolved because having a sustainable water source is vital to the economic growth of any community. When we have a serious medical problem we go to a doctor that specializes in that illness, if we have a legal issue we go to an attorney, in other words we go to an expert to help us become more informed on exactly what our options are so that we can make an informed choice. That's exactly what the Water Utility and the City has done. They acted in a responsible and prudent manner and consulted with experts in water matters like the DNR,</p>	

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	<p>SEWRPC, the USGS, Wisconsin Geological Survey, and UW-Madison. Quite a few alternatives have been studied—including a multi-faceted approach and after years of research and investigating we are now presented with a recommendation. I know for a fact that the Water Utility and the City has spent countless hours dissecting and examining and discussing all the different reports and recommended course of action from the studies. In no way have they acted capriciously or without due diligence or rushed into making a recommendation. As with most things the City deals with, they now should base their decision on the totality of all the information presented by the experts, not just one or two pieces of information that really don't reflect the entire picture. Do I want to pay higher rates? Of course not and I don't think anyone else does either.</p> <p>But the fact remains that we must do something about our water situation. To deal with only one problem and put the other on hold would cost us all a lot more in the long run and this is not the way a responsible city government should function. We can't put the cart before the horse. The recommendation is to get water from Lake Michigan, but the first step is to get approval from the other states involved in the Great Lakes Compact. If granted, that would only be the starting point. To assume that we then be</p>	

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	<p>locked into getting water from Milwaukee is plain and simply inaccurate. I know you've answered most of the questions at previous meetings, but I have a few more. Because of the inaccuracy of some information in the paper and misconceptions that people have the questions bear repeating. It's been suggested that we use water from the quarry, but we all know that the city does not own the water—the quarry is not in the city, so that presents another set of issues. How would utilizing quarry water affect septic and well systems for people in that area and what do you think the DNR's response might be to doing this? What steps would you need to take to make the water usable? Do we even know that the owners of the quarry are willing to sell? I've heard some people have a fear regarding the cryptosporidium problem that Milwaukee had quite a few years ago. I understand this fear and its well justified because it really was very serious. Can you tell us what steps have been or will be put into place to make sure we wouldn't have this type of problem again if we were to get water from Lake Michigan? 3. If we continue to draw down on the shallow wells—for example, the wells south of the city, what would be the affect on the Vernon Marsh as well as septic systems and wells of homes in that area? And likewise, what would be environmental impact of drawing down on the Fox River? What would it take to</p>	

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	<p>make that water usable? 4. Do you have any idea how much the City might be fined per day if we are not in compliance with the mandate set by the DNR? How much have we already paid in fines if we have paid any? How do you respond when someone says the majority of homes in Waukesha already have water softeners to take care of the radium? 6. At the last open house someone made the statement that the draft application appeared to contain a lot of window dressing. Please comment on how you came up with the format and especially the content of the application. 7. How many municipalities currently get their water from Milwaukee and are they having any sovereignty issues at all? Lastly, there have been a number of articles lately written by people fearing that if we get water through Milwaukee that we would be at their mercy and lose our sovereignty. I absolutely do not believe that the Mayor, City Administrator, Water Utility Manager or Common Council would even consider approving any contract that would limit Waukesha's right to govern itself as it sees fit. Having said that, am I correct in assuming that if our water application is approved by the other states involved and that's a very big if, that Waukesha would have discussions with not only Milwaukee, but also Racine and Oak Creek to see where the best contract could be negotiated?</p>	

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Steve Mackie 2230 Stony Ridge Drive	I'm a citizen of Waukesha and I'm concerned with the drinking water we have here. I'm also concerned with what's in the Milwaukee City water—we always hear about the sewage being dumped in there and now we hear about pharmaceuticals that are showing up in Lake Michigan supply. Have there been any studies to show what the cost of removing these pharmaceuticals —should that come down the line as being required to be removed as well and what costs will be passed on to the residents of Waukesha regarding the removal of those items? When these changes are mandated by the EPA down the line, everybody here realizes Milwaukee is not going to pay for the removal of that themselves, they're going to pass those costs on to the city residents and likewise is our treatment plant in Waukesha capable of removing these contaminants from our sewage that's going to be pumped back into Lake Michigan and what the costs associated with that will be. As the EPA gets more involved in this and drinking water, these are going to be situations that arise and I think all of these have to be taken into account when we're looking at the problems we're facing. Right now there's not a problem with pharmaceuticals coming from our groundwater supply, it's just Lake Michigan. That's the main question I have and just want to know if we looked into those costs	

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	and if anything can be done to get us some numbers on that and whether or not affects the plan and the different numbers we see out in the lobby as far as the costs are.	
Sean Doyle S15W37066 Willow Springs Drive—Dousman	I do work in Waukesha and I won't hide the fact I work for soft water. In reviewing a lot of the stuff I see here, some people mentioning water softeners, most people have them and unlike people saying radium can't be taken out, radium is removed through ion exchange as people know up to 80% as well with drinking systems and reverse osmosis can catch another 80% as well as due to removing total dissolved solids from the water. So, as far as making it a drink ability issue that can be contained at a relatively inexpensive level and I've seen some of your format you've shown where some of costs are offset by people not running softeners and then saving all this money through chloride rejection not having to be treated. Reality is a lot of the studies that we're seeing, there are studies showing out that on 10 grain hard water an average family of 4 with a softener on 10 grains will save up to \$1,000 just by installing that. That 10 grain hard water is something you're going to treat because it is obviously aggressive. If you're adding in that cost as something that's going to save these people all this money and reduce the cost per person per household, and you come to find out later that we will be dealing with chloride rejection, how	

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	<p>is that going to affect the cost/person in the end on that? Some of the outskirt areas are going to and can even where I live, become part of this should the municipal wells in those areas also decline to put out the water. As this creeps outwards, and people jump on the bandwagon and think that this is the instant cure, again I back Steve Mackie with the pharmaceutical end of it, not only on the delivery of the water that comes to us which as people say we're not flushing it down the toilet any more, unfortunately, growth hormones, things that people take in their system are excreted and urinated out of them and this ends up going to the treatment plant, but right at this point cannot be taken out. If they do decide to make this something of an issue that we need to have it out before it gets back to Milwaukee, this is another hidden cost that people should know about if it comes down the pike. I do believe the EPA will be working on this. I'm just wondering how much of that money that you sent towards this with water devices currently in use, that you may be using as saved money is added to your cost per capita.</p>	
<p>Cheryl Nenn Milwaukee River Keeper 1845 N. Farwell, Milwaukee</p>	<p>We're a non-profit organization, we were started in 1995. Our mission is to protect and improve water quality and wildlife habitat in the Milwaukee/Menomonee/Kinnikinnick watersheds. We have been following Waukesha's application for probably the better</p>	

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	<p>part of a decade now and we appreciate the information and the access we've gotten from the City's staff. We've regularly submitted questions and comments and received answers to many of them; however, we do still have some fundamental issues and questions that have remained the same over the last several years. Our primary goal is to ensure implementation of the Great Lakes Compact successful implementation and that Waukesha's application meets the provisions of the Great Lakes Compact and also our State implementing legislation. Given that we don't have State rules yet for implementing the compact, there's obviously going to be considerable room for interpretation by the WNDR. While we're heartened by their decision to essentially require an environmental impact statement for this project we continue to be a little bit concerned over discrepancies between how Waukesha is interpreting some of those provisions and how many environmental advocates and others are interpreting those provisions. Our main issues are as follows: 1. According to compact provisions, Waukesha needs to show that they have no reasonable alternative water supply and I don't quite feel they've quite fully made this case yet. Furthermore, the compact is clear that the need for the proposed diversion can't be reasonably avoided through efficient use in</p>	

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	<p>conservation in existing water supplies. We continue to believe that Waukesha does have some reasonable alternatives based both on the 2002 study and the SEWRPC water supply plan. We believe that several valid alternatives that were discounted were probably discounted prematurely and a combination of some of the approaches from the 2002 study really could be combined and looked at and that could have some merit including looking at the unconfined deep aquifer to the west, re-injection options, groundwater inducement, enhanced conservation, etc. One of the bigger questions we have is the application states that the deep unconfined aquifer west of Waukesha wasn't really looked at because SEWRPC made an assumption that the groundwater source had to be within one mile of Waukesha's Utility service area. I think there were also concerns over public nuisance that's mentioned in the application and that seems to not make a lot of sense given that we're now pursuing a Great Lakes diversion which is 7 miles away and also has its own suite of regulatory and legal issues. I have a question about that alternative in particular and why it wasn't looked at. Our second major concern is whether the quantity of water Waukesha's requesting is reasonable. This was mentioned by a previous speaker, I think the water supply options would reasonably address Waukesha's current needs;</p>	

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	<p>it seems Waukesha is planning for substantial growth that may require additional water. Given projected population increases of approximately 25% until 2028, Waukesha is requesting nearly 100% increase in the daily maximum demand. At the last hearing the City mentioned that was due based on past statistics and worse possible scenario with drought, etc., however, we're really wondering if it makes sense to look at those past statistics given that there's a plan now to have aggressive water conservation and also given the fact that a lot of industries left the city so there just isn't as much water demand as their used to be. There continues to be a question whether the water being requested is really to resolve your legitimate public health issue with the quality of the water or to fuel unsustainable growth. We continue to question the robustness of Waukesha's water conservation plan. Looking at the draft application, it's not clear that the benefits of the ongoing water conservation are factored into that future demand number. Also, it's not clear when looking at the statistics what part of the declining water use in recent years is due to declining industry and what's just due to climatic patterns—so if that could be clarified that would be helpful. Clearly, Waukesha, in order to make a strong application needs to show that there's a strong conservation program in place. Clearly there's</p>	

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	<p>already great strides taken in the right direction, however, I think a lot of the language in the application pertaining to conservation in particular seems to be pretty weak and without any numeric or hard goals that have to be met by a certain time. Many of the goals in the application seem kind of nebulous—enhance outreach, implement water audits, so a lot of these things don’t necessarily translate to water conservation or reduce use of water. I think it’s important that there’s more information about monitoring in particular and enforcement of the water conservation. We continue to be concerned about lack of return flow alternatives, although several alternatives were looked at in the application in the general sense, it’s clear that the City’s only conducted really a meaningful analysis of one being Underwood Creek. We would expect that the EIS would have more information as far as looking at a thorough analysis of return flow alternatives and the environmental and economic impacts of each one of those. Given basically the possible impacts on both the water quality and the quantity of Underwood Creek in Menomonee River, we feel that an impact statement should ensure that there are no other reasonable alternatives and that any return flow scenario is protective of the physical, chemical, and biological quality of the streams that are potentially impacted.</p>	

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	<p>We're also concerned about the quality of return flow. The compact states that there should be no significant adverse impact from diversions and state implementing legislation requires that there be no degradation biological chemical or physical. I think by the appendices we continue to have concerns in particular about the bacteria loading that would be coming back into the creek. Fecal coli form levels are on average 9 times higher from your wastewater treatment facility than MMSD's maximum number for their contractors. I should add that's not during the summer months, but during the rest of the year. You have very high bacterial loading—at a minimum as an advocate, I'd be requesting that you treat fully with your UV system all year round to get those bacteria levels down. I think this is really important that you know that Underwood Creek is impaired for bacteria already, so it's really important that we reduce the level of bacteria. Likewise, the phosphorous levels that are coming out of your plant are higher than what's being proposed right now for rivers and streams as part of new criteria that the DNR is promulgating for phosphorous. I mention these things because clearly as advocates that those issues and that pollution loading is decreased should there be a return flow into one of our area streams. Also, because I think it's important to factor into</p>	

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	<p>your costs, as well. Factoring costs of a Lake Michigan diversion alternative. Given that we really don't know which community is going to sell water to Waukesha, we still have a lot of questions about whether or not the application will meet compact provisions in terms of the closeness. As people might remember, the compact calls for all the water that's taken from the lake. It has to be returned in a point that's as close as possible to where the water is withdrawn. That's something we're still not sure about whether or not that's going to meet the provisions of the compact. As a river advocate organization, we are concerned about the cumulative impacts on our creek. Again, we think that the EIS is great and that we'll be able to address those things. I just want to make people aware that Underwood Creek is being proposed right now for 33% increase in flow due to potentially the Zoo interchange expansion. These are things from my perspective that are important to look at because not only is there going to be an increase in flow from potentially Waukesha, but also from other projects that are being planned in the region.</p>	
<p>Faye Emerson W270S3565 Oak Knoll Drive</p>	<p>I spent a lot of time going over the application and reading the compact—all 706 articles—and I still have questions. Mr. Duchniak tried answering some of those answering the water demand on Exhibit 2-3 and I guess I'm hoping</p>	

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	<p>that will be adjusted soon. I saw some serious flaws on that and that table will be redrafted to account for the demand that the application is asking you for. Hopefully, they'll be on your website soon so we can make further comment and not be in the EIS mood. I have to be pretty critical about the PR on this project and the application. This one piece—published by the Waukesha Water Utility—it's the Waukesha Needs a New Water Supply—Lake Michigan—The Best Water Choice for the Environment in our Region. I'm just really concerned about the bad information and technical information that's in this piece. It goes to the credibility of your application. For example, the piece really speaks very highly of your inflow and infiltration into your sanitary system. That means the clean water that goes into the manholes and the cracks, you take credit for that. You are sending clean water to your sanitary system to be treated which is a lot of money. You're taking credit that we have this flaw in our community clean water going into our sanitary system because of all the leaks we have and the manholes and you think it's a good thing. It's a bad thing. You should be repairing those leaks and getting that clean water out of your pipes that are going to your sanitary system to clean. You say something different in your application. I think you have a real problem with me with credibility while</p>	

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	<p>saying that's a good thing. Every engineer, every DNR person will tell you that that is a bad thing to have a lot of inflow and infiltration going into your sanitary system. Looking at the compact language and what's required in the diversion is I don't see anywhere that you need to talk about cost. What things cost. I don't think what the alternatives cost need to be in your application. Unless I'm not finding it somewhere in the compact, it says reasonable—based on public health, but it doesn't say anything you choose the least cost method. I'm respectfully requesting that all the costs be pulled from your application. It could be in your decision whether or not you're going to seek Lake Michigan water as a council or as a Utility, but I don't see any need to put it in your application of what the costs are.</p>	
<p>Dennis Grzezinski Sr. Staff Counsel for Midwest Environmental Advocates 312 E. Wisconsin, Suite 210, Milwaukee</p>	<p>We are a 10 year old non-profit environmental law firm serving environmental issues with offices in Madison and Milwaukee. It's important that because the application by Waukesha is likely to be the very first application under the Great Lakes Compact, it will be serving as a precedent and setting a precedent for whatever applications are submitted and acted upon in the future. As a result, you are neither the enviable or unenviable position of having all the sets of eyes within the compact States and Provinces not just those of us who live in your</p>	

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	<p>neighborhood looking at this application. It's going to receive extraordinary scrutiny. There are no ground rules. The compact says what it says and as previous speakers have indicated lots of questions have been raised. Those questions and other questions are going to need to be answered to the satisfaction not to just the WDNR, the Governor of Wisconsin, but ultimately of the Governors of each of the other states. It seems to me that if Waukesha proceeds with this application, then it's in your interest to make the most complete and thorough application that you can. If you go ahead with the difficult and expense process of filing the application and seeking the diversion then you ought to do a good job. Because only a very good job is going to answer all of those questions. Take all of these things into account and do it thoroughly, transparently, clearly. There are a number of clear questions that have been raised—the question of unavoidable need. The compact is clear that the need for any proposed diversion cannot be reasonably avoided through efficient use and conservation of existing water supplies. Under that requirement, it is very puzzling perhaps unfathomable, because of the complete abandonment proposed in the application of Waukesha's current water supplies. You are asking for all of your needs to be served by Lake Michigan water. That's going to raise all</p>	

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	<p>sorts of questions and certainly nothing I've seen answers that question. It's not at all clear that Waukesha's application has considered all reasonable alternative water supply sources which is necessary. It is evaluated how much of the required diversion could be supplied by another combination of other sources. That's also tied into the reasonable use requirement of the compact. It's clear that diversions are limited to quantities that are reasonable for purposes for which the diversion is proposed. The use of water for growth certainly raises the stakes in this application. According to your application, the population is projected to increase by somewhere between 25—30%, while average annual demand I believe increases by 58% and peak daily demand increases by 87%. In view of the need for addressing conservation, the historical loss by industrial users which used to be your main draw on water use, the dramatic increase in requested water, again, causes head scratching. How can this be? The current materials don't give an answer that I submit is going to be satisfactory at least several of the other states. How much of the water is needed for growth, how much to sustain the folks, the businesses, the uses that are already here? I think you need to lay that out and why you need the numbers you're seeking for each of those components. Return flow—the compact calls for all used</p>	

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	<p>water to be returned back to the Great Lakes basin less the allowance for consumptive use at a place as close to the place at which the water is withdrawn. I've not seen an explanation for why Underwood Creek is as close a place as one could be from where the water is coming out of the lake. There may be good explanations for why it's going to Underwood Creek, the only one I gather from the papers is this is far and away the cheapest way to get it back to the lake. The compact isn't written that says anybody who has a more expensive way of getting water in the straddling counties, is entitled to get it out of the lake if it's cheaper. That's not what the compact says and I suspect that 7 of the other governors, 6/5, are going to look at that view if the reasons are other than economics—cheapest cost—they need to be put out there. If there is some other good reason why it should go to Underwood Creek rather than some other way, lay them out. Environmentally sound and economically feasible water conservation—just saying you're going to have and going to continue the programs you have—I don't think is going to cut it. I think the other governors are going to be looking for a lot more than that. What are the goals? What are the enforcement methods? Particularly in view of the dramatically increased request for water compared to current usage. Compliance with all applicable laws.</p>	

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	<p>One of the provisions of the compact says o.k. folks, meet all of our requirements, that's an essential, but you also need to comply with all other applicable federal/state/local laws. One potentially troublesome applicable federal law would be other parts of the clean water act. Particularly, with the return through Underwood Creek proposal. It appears, at least upon first look at what you're proposing that this is going to be a new discharge to Underwood Creek. Underwood Creek is an impaired waterway for bacteria. There are a number of recent court cases under the clean water act that make it extremely problematic at the best, for an additional loading of a particular pollutant that's the reason a water way is declared to be impaired. I don't know how you are going to get around that, but there's certainly nothing in what I've seen so far, that indicates that anyone has even given that any thought. More troublesome, perhaps, at least based on the current application and the current direction of some of the studies that have been conducted, our EPA policies on environmental justice entitle six of the Federal Rights Act which prohibits any recipients of federal funding from engaging in programs or activities which have discriminatory adverse impacts, not intentional discrimination, but adverse impacts on racial minorities or the handicapped. To the extent that federal funding</p>	

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	<p>is being sought and properly and appropriately viewed by the community as essential and warranted, but to the extent that you get federal fund Title 6 of the Civil Rights Act is going to apply. To the extent that the application is part designed to serve adding growth, housing, industrial and commercial development that means adding jobs, adding all of these kinds of things, at a significant distance from the urbanized center cities of the region—Racine, Milwaukee, where the low income and minority populations are concentrated. That is going to make issues that have been raised by others such as access to jobs, affordable housing, transportation methods and public transit between where people live and where additional and developing jobs are located. Not simply a demand by some neighboring community, but an essential element to be addressed by your community as a recipient of federal funds. It's a situation where, in a sense, we each live in our own bubble and we decide how large that bubble is, but Waukesha has found that there's at least a concern that the bubble in which you live may not have sufficient high-quality water to do all that you would like to do within that bubble. It's not clear to me that that is indeed the situation, but that may need to be the situation in order for you to qualify for Lake Michigan water under the compact. If it is the fact that you don't have</p>	

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	<p>sufficient water for keeping your valuable and wonderful community sustainable as it is and for growing the community even larger in the future, then you are essentially deciding that you have to enlarge that bubble so it reaches to Lake Michigan. If you do that, you have to recognize that you're living in a larger bubble than the very comfortable, but small bubble of Waukesha. When you need to become part of that larger bubble to deal with your water needs, then I think you're going to find that are more and greater and a variety of reasons to need to deal with those other neighbors that are living with you in that larger bubble as they ask you to try to work with them to help solve some of the problems that they have in their part of the bubble. I don't think any of this discussion has anything to do about sovereignty, independence, or freedom or self-government, but simply a legal and practical and for some, a moral or ethical or religious reality. I'm not asking for answers on any of those questions, but it seems to me that you all need to gravel with all of them and if you want your application to succeed, a whole lot more work needs to be done by Waukesha on this application. When I say a whole lot more I'm repeating the actual specific words that Ken Yonker of SEWRPC said, I believe it was last Thursday evening at SEWRPC's environmental justice taskforce. Where you</p>	

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	<p>were in the process. You've done a fair amount, but there's a lot more, a whole lot more, that Waukesha needs to do. I hope together we can all work on that whole lot more that needs to be done.</p>	
<p>Steve Schmuki WEAL</p>	<p>WEAL was formed in 1978, as basically a grass roots environmental organization representing individuals and communities within Waukesha county for the betterment of our natural resources. I also should tell you that my roots go 3 generations deep on both sides of my family—owning property in the city. I am in the proposed water service area on Oak Knoll Road. I do want to ask one question—as I understand it, we have time to make written comments –what is that deadline? So WEAL will be submitting written comments regarding this stage of the proceedings basically on the initial application that's been drafted. I can assure you that we'll also be involved in making comments at the Wisconsin Environmental Policy Act stage when the DNR conducts hearings regarding the scoping for that process as well as any national environmental policy act process that might take place in the future. What I do want to ask that you all seriously consider, as you deliberate this process going forward, is that you will hopefully look at this, not in the narrow context of the City of Waukesha and its needs, although that is clearly your charge and</p>	<p><i>Mayor Nelson</i>—Friday, March 26th</p>

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	<p>your job to figure out how to supply potable, adequate water for the community you represent, but to look beyond that to what you are doing to a potential resource that is global in significance. The kind of precedent that might be created by your application and how that goes forward. We live in more than just the community of Waukesha, we live in a greater area—we live in a region that is inextricably linked to the Great Lakes. Our success, economy, all of that is driven by those lakes. It is WEAL's hope that as you deliberate, as you go forward with the process, you will take that into consideration and make sure you are doing the very, very best that you can to guarantee that you are not doing anything that would diminish that resource. A lot of the technical questions I leave to experts much brighter than myself who know these things, who have asked questions tonight, who have asked questions in the past and will ask questions in the future, but ask that you look at this in a broader context and at minimum, a regional context and resource based context as opposed to Waukesha needs to clean up a water problem both on a quantity and quality level. I think if you do that you will be successful whatever the outcome is.</p>	

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Lori Longtine W271S3581 Oak Knoll Drive	WEAL is going to be submitting written comments to you within the timeframe, but I wanted to say something about this whole process. Thanks to the aldermen for being here tonight. One of the things that has driven WEAL in this whole discussion and debate about Waukesha's water and a potential Lake Michigan diversion is that as this whole thing is unfolding this is all new ground for everyone—the City, Water Utility, our organizations, the Council. There isn't necessarily a right way and a wrong way to do things, but I haven't really enjoyed the tenure of other people that commented both at the meeting last week and one of the speakers tonight falsely characterizing our organization as some Johnny come lately. WEAL has been involved in this issue just about as long as the City and Water Utility have. Our organization is non-profit group. We care about the resources and our community. We have been meeting with the City and the Water Utility when Carol Lombardi was Mayor to start urging them to come up with a conservation plan and offered to work with them and offered to work with them to help put together plan and promote a conservation plan when there was no conservation plan when there was just a plan to have a plan. We offered to help with that and as a result, our organization put on a one day water conference called Water Wise. We	

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	<p>taught citizens about water conservation. That went on for 4 years—there is none this year because this is the big issue for this year, but we will be having it again. We are part of a coalition of other environmental groups that have more of a state wide focus and they have also met with the City and Water Utility. We have experts in our own organizations, biologist, hydro geologists, people that work at the DNR, although they don't speak for the DNR when they're part of our organization. We have offered their expertise, made suggestions about some of the different options that might be pursued, in fact, one of the people that we've been working with is Professor Doug Cherkauer and right now he's working on a research project for river bank and filtration which is a reuse kind of plan. He's going to have that research complete around May/June 2010. I would think that with all this time that has passed and how much work that's been done on this, we would take a few extra months and wait to see what the results of that study might be, unless we're moving to foregone conclusion, which has been my fear all along. I think we sometimes get criticized for being critical, but many of the questions that we asked about this program, we've asked in the beginning, the middle and now. They've been answered or skated around or we don't know yet, we're still working on</p>	

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	<p>that, we don't have all the figures, we can't tell you that yet and up until 6 weeks ago we really had nothing to comment on. We had a proposal to make a proposal but it wasn't actually a proposal. My suggestion would be to slow this down just a little bit. I realize that we have a short timeframe until 2018, but we do have enough water now to solve our problems and we're very close to having full compliance with radium treatment for now. That would buy us a little time to maybe explore some of these options more fully, as well as give some of these new ideas a little bit of consideration at a more public airing. One thing we've constantly asked about is cost. I know Faye Emerson said cost should come out of the Lake Michigan application, and I agree with that, but cost is a very important factor in your decision. The cost should be very public because this is going to be coming out of everyone's pocket. In all fairness, when a suggestion is made to explore an alternative, that should be given a full public airing with—it's going to cost \$32 million more, but what of it is going to cost \$32 million and how did you come up with \$32 million. In fact, how did you come up with \$174 million? About 4 weeks ago it was \$164 million and somehow it crept up to \$174 million last week. The aldermen should look really hard into those numbers and what's being put into those numbers and that does</p>	

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	<p>include something one of the previous speakers mentioned and that's how much we've paid to consultants. Some of the experts that have been working with our organizations have offered their expertise for free and that's a part of the story you haven't heard. I guess I would be asking a lot of questions still at this point and not thinking that this is the one and only answer. This is the one and only thing that has been pursued, to the extent that we have some details that we can say we have an idea of what it's going to cost, how long it's going to take, etc. The one thing you don't have is what the alternatives—it would be nice to have a real side-by-side comparison of the benefits, the costs, and all the environmental factors on every specific option, as well as combination of options.</p>	
<p>Jeff Scrima 125 N. Greenfield</p>	<p>I am here to represent the citizens of Waukesha. I'm not here to represent the county, Milwaukee, SEWRPC; I'm here to represent the citizens of the City of Waukesha. I just want to take you back to the March 2002 Future Water Supply Study that was a comprehensive study prepared for the Waukesha Water Utility. On the first page of the Executive Summary, there's some important information—"The current water supply situation is not critical". There's also data here and a graph which shows that we have over 100 years of water left right below us. So, we have an adequate supply. We</p>	

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	<p>currently have radium removal facilities on two of our deep wells, so we are capable of removing radium if we want to. As far as dissolved solids, that will become more of a problem in the future, right now Dan Duchniak told me that he's projecting that in 2020 the city will have to add more filters to our wells for dissolved solids so we have ten years before we really have to worry about that, but those things can be removed as well. Since the train is going rather fast down the track towards Milwaukee water, I want to examine that. Right now you are representing to the citizens of Waukesha that it's going to cost \$164 million compared to our local sources which you say will cost a \$174 million and \$177 million. On all of these options you have a 25% margin of error. That's huge. So here are my 5 questions: 1. Do you know exactly what Milwaukee will charge per gallon per water? 2. Do you know exactly how many millions of dollars we'll have to pay Milwaukee in economic compensation? 3. Do you know the exact amount of federal grant money we might receive? 4. Do you know the exact price of the pipeline? 5. Do you know that over time having to go through periodic renegotiations with Milwaukee, that Waukesha will really end up saving money? It's easy for you to say we'll negotiate those things out of the deal—we know Milwaukee wants economic compensation. We know they want to control</p>	

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	<p>our housing, our businesses, jobs, and transportation. We're just going to negotiate that out. Maybe you can the first time, but if it's up for renegotiation in 4, 8, or 10 years, many of people will not be here. It's my opinion that you have put us in a terrible negotiating position with the City of Milwaukee. You've already said publicly that Milwaukee is the least expensive source. The Water Utility has not release prices from Oak Creek or Racine because they know they are much more expensive due to distance. The Water Utility has downplayed the use of our local water resources. Basically, you've put the ball in Milwaukee's court. Once we hook-up to Milwaukee, we'll be filling our own wells. The game will be over. Milwaukee will have us over a barrel. There's no going back. Quite simply, you're making a decision for citizens that live in this City, you don't know what it's going to cost, this is an irrevocable decision. Whose ever hand controls the faucet will control the future of this City. Choose carefully.</p>	
Answers to Comments/Questions		
		<p>Dan—Thank you for your many good comments. Some of the comments we've received tonight are more complex in nature. We'll try to address some of them tonight and we'll try to get more detailed analysis out with our written responses that we'll be providing as part of this. Some of these have been mentioned a number of times so I'll try to group things together and try to answer them only once—</p>

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	Why filtering the radium out of the water as it is now instead of applying for Lake Michigan water?	Dan —That is one of the options that is being considered, but just removing it doesn't focus on water quantity. We don't want to invest in something that's not for the long term. We're looking to invest in something that is a permanent solution for the residents of Waukesha. We only want to do this once, we don't want to come back 50 years from now and being in the same position we're in now.
	With regards to population and this regards the water quantity questions.	Dan –The population figures in 2-3 they need to be clarified. There are some SEWRPC numbers in there and we will be clarifying those numbers with regards to water use. We're going to focus on the average day demands that are going to be required to service this city. The maximum day demands are only required a handful of times each year. The average day over the last 20 years was 7.9 mgd. That takes into account all drought, where the industry was, what the residential use was—it factors in everything. If you look at what that demand will go up—it will go up from 7.9 mgd to 10.9 mgd on an average day. That's only a 3 mgd increase for the amount of population that we're talking about, but we'll also looking at managing to the average day and not the max day, for both the water supply and return flow. Because on the max day, you do not have that volume of return flow that you're using, so we manage to the average day rather than the max day. We will clarify those numbers in the draft and we'll make those corrections as we move forward in the draft and we will also address it in the written comments as part of our answers.
	With regards to how much money has been spent on the different studies.	Dan -I don't have that number here, so I can't quantify that at this point. I will work to clarify that as to how much has been done.
	With regards to utilizing the quarry water and how it will impact well and septic.	Dan —We'll have to look into that. To make it usable we will have to treat the quarry water to drinking water standards so we will have to install a treatment plant at the quarry location to provide that treatment to the level of surface water quality.

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	Crypto fear and what has been put into place.	<i>Dan</i> —A number of communities along the lake have addressed the cryptosporidium issue from ozone to membranes to UV, there's a number of different ways that the treatment plants have addressed that and have installed a second barrier to the crypto issue. That has been addressed and the quality of water that they are putting out today far surpasses it. I believe Milwaukee was ranked 19 th out of the top communities in the country for their water quality.
	Drawdown of the shallow wells and the impact to the Vernon Marsh.	<i>Dan</i> —We are completing, as I said before, SEWRPC completed a model in the Troy Bedrock Valley, which is that aquifer. We are completing a study as we speak right now. We've been through a number of iterations through it and that study will be incorporated into the final version of the draft application.
	Fines.	<i>Dan</i> —Fines are \$10,000/day/well, so they add up pretty fast. We have been fined \$55,000 currently.
	Why can't we utilize water softeners?	<i>Dan</i> —This was a common theme amongst a number of people. The DNR will not allow us to utilize water softeners. If we wanted to utilize water softeners for radium removal, we would have to ensure that they were plumbed to the kitchen sink and we'd have to be responsible for operating and maintaining all of the water softeners in the City of Waukesha to make sure and ensure they are in working order. Therefore, water softeners is not a reasonable solution to the radium issue.
	How many communities currently get water from Milwaukee?	<i>Dan</i> —15 communities—Brown Deer, Butler, Franklin, Greendale, Greenfield, Hales Corners, Menomonee Falls, Mequon, New Berlin, Shorewood, St. Francis, Thiensville, Wauwatosa, West Allis, and West Milwaukee. I would also say that Milwaukee contracts are currently 10 to 20 year contracts. The last one that was negotiated was a 20 year contract. There is an automatic renewal clause so the contract does renew automatically unless one party files to reopen that contract which, since Milwaukee has passed the Resolution providing the

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		information be provided, 6 communities have had their water contracts reissued.
	Pharmaceuticals in the water.	Dan —Milwaukee currently treats its water with ozone, as I had said to cryptosporidium. Ozone is one of the best treatments for pharmaceuticals and so that would be a good alternative once those requirements, if they do, come into place. The other thing that is important to note that there is pharmaceuticals in our current groundwater. In fact, Dr. Cherkauer just presented a report that was discussed here earlier that showed that there's pharmaceuticals in the shallow groundwater that we're looking at to the south of the city. So, to think that if we go away from Great Lakes we will get away from pharmaceuticals is a misstatement. Because we will have pharmaceuticals in the shallow groundwater. They're there now because they do come from the wastewater stream and there are septic systems that are on this aquifer and there are also 3 wastewater treatment plants that discharge to the Fox River. Recently viruses have been found in the deep aquifer in some of the cities that utilize the deep aquifer. To think that we're getting away from these issues if we stay away from that source is a misstatement.
	Questions regarding State rules and interpretation by the DNR.	Dan —I'm not going to try to address every question regarding State rules and the DNR, but we can't just look at the compact, we have to look at what the state legislature already implemented with regard to the compact. They did define what a reasonable water supply alternative was and they did define without adequate supply of potable water. The statute also requires a cost effectiveness analysis, so cost needs to be considered.
	Statement about Doug Cherkauer and the river bank filtration that he's looking at and doing the testing on.	Dan —We have looked at river bank filtration, in fact it is one of the options that is considered. That is the Fox River Alluvium that is riverbank filtration. I was at the meeting with Doug Cherkauer when he was presenting his results. In our example, we used 9 mgd of water/day of water coming from the Fox River alluvium. I asked

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		him if that was reasonable for us to assume that and he replied that it was reasonable, that the only issue would be with regards to spacing of the wells along the Fox River, which is something we are looking at and we doing studies with the groundwater model that was recently done. We have looked at river bank filtration—it is one of the alternatives that is out there for us—that is the shallow and Fox River alluvium we are considering.
	There was also some question about the numbers changing.	Dan —I don't know where the numbers have changed because these are the numbers that have been out there. These are the numbers in the application as it is now. They're the numbers that were presented at the last public meeting; they are the numbers that are being presented tonight with regards to costs of the alternatives. I'd like some clarification on that, if you could contact me and let me know what numbers you are referring to. There was some confusion that the numbers have gone up, because the numbers have not changed since we put these numbers out.
	A statement that we are close to full compliance.	Dan —We are not closed to full compliance. Full compliance is when we can take our largest facility out of service and still provide our maximum day water demand to our customers in compliant water. We are not close to final compliance. We have an interim compliance status. We are interim compliant with the radium standards. The DNR has negotiated with us so that we have until June 30, 2018, to be in compliance with the radium standards. We are not close to being in compliance with the radium standard and that comment is irresponsible.
	The environment was mentioned a lot.	Dan —With regards to the return flow and the Underwood Creek being environmentally impaired for fecal bacteria, we have looked at that and we are looking at that. It will be addressed in our environmental report. As you are aware, we utilize UV at the treatment plant. One of the options we are considering is utilizing UV year round to address that.

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	Lack of rules question	Dan —It is important to look at what the legislature did provide and they did provide a bill that is 175 pages in length and provides a lot of guidance. There was knowledge when we were going through that process by everyone that was sitting at the table that it was Waukesha’s intent to apply for a Great Lakes diversion. That is why there was so much time spent on the rules that were created to implement the bill. That is why there’s 175 pages of implementation language so there is a lot of guidance that was provided by the legislature. Again, we are doing an environmental report—we are looking at environmental impacts and we will have that the addressed in the environmental report that will be coming out as an appendix to the application and it will be the basis for the environmental impact statement that the DNR is putting together.
	Why don’t we use partially Lake Michigan water, why do we use some groundwater, why do you use some deep aquifer water?	Dan —The reason we switched to a Lake a Michigan supply is because it is the most cost effective and most environmentally beneficial. I’d like to point to the Illinois consent decree which also states that once you are allowed a diversion in Illinois, you must abandon your aquifer or groundwater sources. You must abandon those and you can only use those in emergency situations. The Supreme Court has already ruled on this that it is of benefit to get off of the aquifer when you get a Great Lakes diversion.
	Return Flow Water and where’s the benefit of returning that water all the way to the lake?	Dan —State Statute under the Exception Standard 3M, it says “the place at which the water is returned to the source watershed is as close as practical to the place as which the water is withdrawn, unless the applicant demonstrates that returning the water at that place is one of the following: A. Not economically feasible. B. Not environmentally sound. C. Not in the interest of public health.” I just want to point that one specific case out because it is an example of in-state law where the legislature already addressed this and looked at it.

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	There were also some questions about growth and a number of comments about accommodating growth.	<p>Dan—Again, I want to point back to the Statute requires us to look at growth. The Statute requires accounting for growth. That is why we submitted to SEWRPC and requested that a service area be defined for us. That is why we had SEWRPC look at what the population would be of that service area. That is why we are basing our water calculations or our diversion application off of those numbers. Now remember, our diversion application is going to be based off of what the ultimate population is. We are only going to ask for water once. We will only go to the other states once to ask for water for our service area. However, when it comes back to a state level, the State has a water supply service plan and they are planning over a 20 year period. So while we will ask for an application that will address our water for the future for our ultimate service area, the State will utilize their powers under the water supply service area to review our plan every 20 years and tell us how much water we will be able to use over that 20 year planning period. We will have to be going back to the State similar to what we do with the Wastewater Service Supply Plan, they reissue that plan every 20 years and it gets reviewed every 20 years and it gets reviewed every 20 years—that’s the process that they are going not only for Waukesha, not only for our community, but for all communities within the Great Lakes basin there will be a Water Service Supply Plan. They will be monitoring that over a 20 year period. Just because we get an application for an average day of 10.9 mgd, that doesn’t mean that, we will have that water available to us immediately. We’ll have to comply with what the DNR tells us as part of our water supply service plan.</p>
	The western alternative	<p>Dan—The western alternative was referenced in detail in the Water Supply Study and it is also referenced in the application. I would encourage people to look at it there.</p>

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	With regards to the 100 year water supply	Dan —That was before Act 3-10. That was before we were required to manage our groundwater in a different way. We are now part of groundwater management area. There are only 2 groundwater management areas in the state—one is in southeastern Wisconsin and one is in Illinois. It would be an inaccurate statement that there is 100 years of water left. There's no technical information that supports that at all. If there was, we would not have participated in numerous studies. SEWRPC would not have done their 3 year study. Waukesha would not be subject to the requirements of Act 3-10. If we had 100 years of water left, we would not have to do all this. We're doing all this because we do not have 100 years of water left—the time to act is now.
	Negotiations	Lori —Clearly, in regards to negotiations with any of the 3 potential providers, there is certain information that we are obligated to provide in the application that is available to the public. It would be radically inappropriate for us to discuss any of the specific terms of the agreement that would negotiated with any of the 3 providers that are listed. Clearly, the City of Milwaukee is the example that is utilized in the application and is discussed most frequently. We will be actively negotiating with all 3 of the potential providers to determine what the terms and conditions are that are in the best interest of the City of Waukesha. In regards to the charge for water, it is important to understand that none of the 3 providers are able to establish their own rate. The rates are controlled by the Public Service Commission. So, that dollar figure will be determined by the PSC. Again, any of the other specific terms of the agreement, the parameters within which we will be negotiating assuming the application moves forward will be established by this Common Council and will be adhered to by the negotiating team. I think it's very important that we separate the negotiation with the provider and understand that just like we

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		negotiate our contracts with our 10 unions, we go into closed session, we discuss the parameters of those negotiations and prior to approval, those details are available for public consumption and a public vote is conducted.
	Legislature	Dan —The legislature has spoken with regards to this issue as it relates to groundwater. There is ACT 3-10 and there is the compact implementation legislation. There's a lot of guidance in there. I sat on the Groundwater Advisory Committee that is currently—a bill was introduced yesterday that is going to look at the groundwater management areas and how groundwater is going to be legislated. I also sat on the Great Lakes Compact Implementation Legislation Committee. There's a lot of legislation that's out there that provides guidance, there's reports from the Groundwater Advisory Committee that provides guidance. I would encourage people to look at all that information that's out there because the state legislature has looked at that and the state legislature has told us that we're in a groundwater management area. So we must view our groundwater resources differently than we did in 2002.
<i>COMMON COUNCIL QUESTIONS/COMMENTS</i>		
Paul Ybarra	I mentioned last time during this forum that these types of meetings are really important and essential for Waukesha residents. As much time as I've spent researching this and speaking with a lot of people in this City, Dan—you mentioned a little bit about the Supreme Court and a ruling they made about getting off of deep wells or aquifers, can you expand on that? You talked about the PSC determining the water rates. Can you talk in general about the PSC and how those rates are determined?	Dan —The City of Chicago is allowed a diversion from the Great Lakes of 2.1 billion gallons/day. That is water that is diverted out of the Great Lakes basin and not returned. Their Supreme Court has been asked to review that decision a number of times, and in that decision they made it a requirement that anybody that is provided an allotment of Great Lakes water by the Illinois DNR is required to eliminate groundwater as a source of water with the exception being only emergency situations and those emergency situations are clearly defined by the Supreme Court.

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	<p>Who sits on the PSC?</p> <p>The PSC is an independent 3rd party state organization, correct?</p> <p>I think a big concern is always—hypothetical—if we continue down to a path that leads us to Milwaukee, Oak Creek, or Racine will any one of those 3 cities have influence or say on what those rates that are set by this 3rd party state organization the PSC? They have to be in compliance with whatever that rate or markup is that's allowed. If we eventually went down the path and one of the 3 communities that we've talked about is the path that Waukesha decides to go for a long-</p>	<p>Dan—The PSC does what is called a Cost of Service Study and what they do is they determine what the cost is as it relates to each level of service that's provided whether that is residential, industrial, commercial, wholesale, or government entities. They look at what the cost is to the Utility to provide that service. The break it down, and based on what it takes to provide that service, they're allowed a rate of return on that cost of service. They're allowed to make a certain amount of money based off of what that cost is and then they set the rates based off of what that cost of service is.</p> <p>Dan—There are 3 members that are appointed by the Governor and those rates are subject to intervention by any interested parties—For example, when we went through our last rate case, it was intervened by Clean Wisconsin as an interested party and they were involved in us setting our inclining rate block structure and the levels of the inclining rate block structure for our residential class customers and they were also involved in reports that were required as a result of that rate case.</p> <p>Dan—Correct.</p> <p>Dan—They submit the rates and they have to open their books to the PSC for review of the costs that are associated with setting those rates.</p>

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	term sustainable water supply, Milwaukee, Racine, or Oak Creek would not have the ability to set whatever rate they want?	<i>Dan</i> —Correct.
	<p>Dan, you talked about other communities that currently purchase water in a wholesale scenario—like we’re talking about is one of the options for Waukesha. You said there are how many other communities that currently have deals with the City of Milwaukee. So, Waukesha, if something were to happen where we continue down this path with Milwaukee, Waukesha is not the first one. Of those 15 that you mentioned, you said the average contract length is how long? You had mentioned that the auto renewal will continue as long as a party doesn’t raise a hand and want to open it up? Have there been any changes to those auto renewals. Past history usually dictates future actions. If we have 15 communities that are already buying water, 6 of them have been renewed over the past 10 years and each has auto renewal without any issues or changes in the terms of the contract. Dan, it’s real important I understand if those are accurate. Can you verify that and report back to the council? Another city whether it’s Milwaukee, Oak Creek, or Racine causing Waukesha to lose its sovereignty, independence or self-governance. I know the last time we were here and City Administrator Luther you mentioned that you would not bring this Council or our</p>	<p><i>Dan</i>—There’s currently 15 other communities that have deals with the City of Milwaukee.</p> <p><i>Dan</i>—It varies between 10 and 20 years with automatic renewals in those contracts.</p> <p><i>Dan</i>—Correct. Since the Milwaukee Resolution went into effect, there have been 6 that have been renewed. West Allis was renewed in 2006, Wauwatosa was renewed in 2003, Brown Deer was renewed in 2000, and Menomonee Falls in 2008, Mequon in 2003 and that was a little more complex because they went to WE Energies as a supplier to a municipal supply, and Butler in 2009. No changes to those auto renewals. I should say as far as I know there have been no changes. The only change I was aware of was in 2003 when Mequon went to WE Energies supplying the water to that City to a municipal supply. They sold it back to the municipality.</p> <p><i>Lori</i>—That’s absolutely correct. I think it’s also important to note that of these 15 other communities, many of which are in Waukesha County, I don’t believe that any of them placed their independence, their sovereignty, or their self-governance at risk. Even if they had, we certainly would not follow that path. That is not the path that has been pursued by these other communities that</p>

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	<p>City a contract that would in any way impact our sovereignty, independence or self-governance. Is that still your intent if we continue down the path? They are not being dictated housing, transportation or anything along those lines?</p> <p>So, informing of housing, but not required to apply to anything that is dictated.</p>	<p>already have agreements with the City of Milwaukee, specifically for the purchase of water.</p> <p>The only issue that has come up in regards to those 3 areas is a request for a report that indicates the demographics of your community information. That is really what the Resolution that Milwaukee passed requires. It requires a report providing them with information. I think that has been gravely misunderstood and I think it is important to appreciate the fact that as we negotiate with each of the 3 potential providers, we'll be looking at what is the best economic solution, the best environmental solution, what is the best solution in totality for the City of Waukesha. This Common Council maintains control over that process as we move forward.</p> <p>Lori—Absolutely, no.</p>
Kathleen Cummings	<p>When we had the presentation to the Council a few weeks ago, when I asked the question how long would it take the aquifer to regenerate—9 years came by. Please elaborate. The number 9 came out that night and I was shocked. When we do this application and we go to Great Lakes water, if that's our path, you say we need to abandon the aquifer—how long? If we go down this path, we have no intention of going back to the aquifer—period—unless it's an emergency. We would be abandoning forever the deep aquifer?</p> <p>One of the citizens came forward tonight and talked about cracks and leaks and sanitary system—not a good thing. Can you elaborate on that? The concern came that if we're going to apply for Great Lakes water, we don't want</p>	<p>Dan—Ending the use on the aquifer by all the communities in southeastern Wisconsin, not just the City of Waukesha, means that the aquifer will recover 50% in 7 years and 90% in 70 years according to the USGS. I apologize if there was a misstatement. Under the Illinois consent decree that there was a requirement by the Supreme Court that the communities that are allotted Great Lakes water, must abandon their dependence on the aquifer as their water supply, with the exception of emergency situations only. That is our intent only, that we would abandon our deep aquifer wells and utilize our shallow wells as a redundancy and back-up.</p> <p>We would be utilizing the shallow aquifers for emergency back-up. The current wells that we have in the deep aquifer we would be abandoning, yes. You've abandoned the existing wells, but it does not preclude you from in the future if you for some reason had to switch water supplies again from using the deep aquifer as a source.</p>

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	<p>to get turned down, so we really want to have the best possible draft application as we possibly could. Why is that a concern and have we addressed it? Is there a goal with the City to reduce that? Conservation—on/off week of sprinkling/toilets, etc. Do we have this written out or stated that by we do the Great Lakes Water Application and it's our intent that 5 years down the road it's now 20%, we now decrease by 15%? Is that anywhere within the application? It could be like a benchmark or goal. As an alderman, I would want to see—we're at 20%, that what are our goals? What will be the goal? I'd like to see benchmarks. In another venue as a County Board Supervisor, I've heard Dale Shaver talk to the County Board in regards to our housing mix. That we the City of Waukesha are the ones that make Waukesha County work. I'm not real considered about how Waukesha stands up with that because we are carrying the load for the entire county, but I am concerned because I did sit on Parks and Land Use—I'm getting back to the speaker who said do we have measurables to make us look better over time in how we're conserving? In our land use plan and as we do plan unit developments, we like bulldozers, curbs, and gutters. Perhaps we should take a different view. Maybe we should be proactive looking at how we can incorporate environmental things to foster filtration in the</p>	<p>Dan—We have addressed it in the application. The City is looking at the infiltration and inflow into the sanitary sewer system—that's under the Director of Public Works—Fred Abadi. They are doing a study as to reducing infiltration and inflow, but even under the tightest systems, you are not going to eliminate all infiltration and inflow. There will be infiltration into your system. Currently, I believe the average is about 20%. We have a conservation and protection plan that the Water Utility Commission adopted and this Council has worked with us on implementing and within that Water Conservation and Protection Plan, there are short, mid and long-term goals that we are looking to accomplish. Those related to the short-term goals—sprinkling ordinance, change in the rates, toilet rebate program and some of the programs we've come out with. There's other mid and long term goals. The infiltration and inflow into the sanitary sewer system is something that is discussed, I believe in the Conservation and Protection Plan, if it's not, the City is implementing an I & I Study to reduce infiltration and inflow into the sanitary sewer system and I don't know what the City's goal is, but I've heard of goals to reduce it to 10%, if it's at 20%, but I don't know what the current City's goals are. I would agree that there should be goals and that would be part of the recommendation when the study is complete. The study is currently underway.</p>

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	future. We tend to have a lot of subdivisions, asphalt, curbs and gutters and my colleagues on the county level when we've taken tours that we could do better. As a staff maybe that's something we could do better.	<i>Dan</i> —As part of the Conservation and Protection Plan, there is a goal to review the development criteria, but I believe there also are requirements of new developments that require certain storm events to be retained onsite and look at different goals with regards to storm water.
Joe Pieper	I've had an opportunity to read through application, but my comments and questions are simply tied to the document and I'm keeping all options and alternatives very open as I continue to collect input from my constituents, I know you wanted some input on the document. Dan, a lot has been talked about Exhibit 2-3 that it's going to be amended. I think it's important to note that as I read through the document; there was a top paragraph on Page 1-3 that did not tie out real well to that Exhibit 2-3. One of the other points that were made to tonight is about what the City has done in the areas of conservation. As I read through the application that's touched on Pages 2.6/2.7, a couple of recommendations that I feel would be helpful 1. To detail what the City and Utility's old rate structure compared to the new rate structure so a reader can tell what was done historically to what changes were made in the rate structure from a conservation standpoint. 2. Talk more about other conservation options that are available that the Utility could consider. Maybe options that other municipalities have available in the realm of conservation would be important. On	<i>Dan</i> —Correct.

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	<p>Page 4.9 there is a minor comment in last sentence of the 2nd paragraph that says that Waukesha already has some of the largest well pumps in the world. There should be more description around that if we're going to make that statement from a validity statement. Page 4.18—there's some discussion about the environmental impact of the various alternatives and how certain alternatives could/would reduce the carbon footprint. I think it would be valuable to detail how the Utility and Consultants came up with their definition of a carbon footprint. Page 4.19 under Implement Ability—land purchase requirements would be less than a groundwater alternative. I talked to Alderman Tortomasi this evening, and I want to make sure I'm understanding this clearly, that what that sentence states is if Lake Michigan was the alternative chosen, we would be using easements to run the pipeline vs. property purchases. Is that true, Dan? There is a section under the return flow that talks about the perspective route it would take and different alternatives to get there. My points in closing were around 4.21—when we start to talk about the cost estimates. Present worth cost is something I've heard of, but I didn't really see how that's detailed or how it's determined. I think it's important that if we are going to use a statistic, that we better define what it is. As a</p>	

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	<p>member of the Board of Public Works on Page 5.4—there’s been a lot work that’s been done instigated by the Board into looking at I & I. There is a very in-depth study on both systems that’s currently ongoing in the City. The City does understand that it is a big problem with an aging infrastructure. It would be very helpful to partner with Public Works and detail that study.</p>	
Paul Furrer	<p>Dan—\$164 million capital costs for Lake Michigan water—that includes the 25% fudge factor. That’s not on top of the \$164 million, that’s including your extra fees, etc.</p> <p>If we don’t get or pursue Lake Michigan water and we build treatment facilities to our shallow and deep water aquifers, and we don’t need that 25% contingency. That \$177 million gets knocked down to \$133 million. You can compared \$133 million to the outside max of the Lake Michigan water of \$164 million—let’s just say those were the numbers we were looking at from the beginning. Would you, as the Water Manager, still recommend that we go to Lake Michigan water?</p>	<p>Dan—There is a 25% contingency that’s built into that cost. The \$164 million figure includes all direct and indirect costs. There are legal costs that are associated with easement acquisition or with regard to land acquisition. There may be some land that would be required for a pump station or some discharge facility that would go back.</p> <p>Lori—I understand that this is maybe a little bit difficult. We used our best case scenario to establish a cost estimate. If the location is changed, based upon individual negotiations, the amount may change. Yes, if the City were to go to Oak Creek or Racine, the costs may be different. We had to provide an example within the application and that’s why the majority of the detail is around the Milwaukee example. It is based on a series of assumptions and estimates to provide the Council, we hope, with enough information to take this first step to move forward with the application for Great Lakes water. Additional details and information will be coming forward as negotiations are conducted to firm up those final numbers. Given the facts that this is such a large project, a 20% contingency is typically what one would use in calculating—using a 25% contingency to provide some additional flexibility, but it would certainly be our marching orders to come up with an option that is within the dollar amounts being presented.</p>

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	I would like an answer to that at some point. I feel that “yes” I would still want to pursue Lake Michigan water because of the sustainability. I’d like to know what you and your experts can come up with if the numbers were reversed or different than what they are to the extreme.	Dan —Based on that alone, I couldn’t give you an answer. There are number of other factors—the DNR and the State requires us to look at 4 different factors—one being cost, implementability, sustainability, and impact to the environment. Without reviewing what those other impacts/factors may be, I can’t answer that.
Kathleen Cummings	The date we’re to vote on this is the date after the election, which is April 8 th . My concern with the date being April 8 th would be perception becoming reality for the constituents. We’ve been at this since I’ve been on council. We’ve studied it, we’ve had closed sessions about it, we’ve worked on it. My concern with the application, with the citizens we represent, that with the date of the vote, why we who have sat in these seats for a number of years don’t think it’s rushed, one might believe if you weren’t working on the project, that we want to get the vote done before the new council is sworn in. I don’t know how you want to speak to that, because then you’d have another whole learning curve. Voting now vs. a later date.	Lori —It may not appear this way, but in looking at the timing for adoption, April 8 th was the soonest we could get the application prepared and brought back in a revised fashion before the council. Understanding that it needs to go to the Water Utility Commission first. The Water Utility Commission will be taking action on the application at its regular meeting this month. That’s the next opportunity. We simply could not get the application in a final form to have formal action by the Council in March. I think there is value in the individuals who have spent a great deal of time studying and understanding this issue in determining this particular policy moving forward. Clearly, there are a number of very key decisions that are going to need to be made that are going to back before the Council and before any final action is taken before any agreements, any construction, theoretical or otherwise, any of that happens, it has to come back before the Council. We cannot move forward with even the option of pursuing Great Lakes water until this Council votes for the application to move forward. If the Council chooses not to move it forward, then we’re at a standstill. If the Council does decide to move forward, then that is simply the first of a series of numerous additional steps that are going to be coming forward. Timing, being as it may, that’s where we are in the process and I think this has been a very transparent process. I think there have been multiple numerous opportunities for the public to make their concerns known. All of

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	<p>I'm familiar with the timeline having been involved with this since 2001, but I think it's important for the public to hear the answer. It was an awkward question to ask, but I think it needed to be vetted. The fact is, this is the application.</p>	<p>the information from the public is being received as being documented and will be supplemental to the application, so really as far as the public's concerns and issues being part of the consideration, I think that this is probably an unprecedented opportunity for public input into a policy decision that will guide any Council moving forward.</p> <p>Mayor— As Mayor, and Dan as Water Utility Manager, we have to go back to January 2009 when we brought in Peter Anin to give us the big picture and we had a DNR representative talking about the process and it was really in August 2009 before we had any idea who was running for Mayor, who was running for Council, that we set a tentative date for December. We had a tentative timeline unveiling it in December, public discussion December/January/February. Originally, we had said February or March was when we thought we would vote. We got information late November from the DNR that the path that we were on for the application needed to be modified. We got additional information that we needed to do some different things with the application before we unveiled it and that's when we delayed it from December to end of January. This is our 4th public meeting—we said all along, depending on how these public meetings went, that is when we would finally ask the Council to move forward. As we talked about for the past 1-1/2 yrs., this entire application process will take a year by the time the DNR, other states and everybody reviews it and if we would get a “yes” to move forward, our best estimates is the 5 years for design, construction and implementation of return flow pipeline and as Dan has said a number of times, that only gives us about a 1-1/2 years buffer to deal with legal challenges and legal issues. Unless we hear differently, we feel March 18th the Water Utility Commission will hopefully be ready—April 8th just happens to be the first Council</p>

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		meeting after that. One of the issues that's been discussed a lot is what would a negotiated agreement look like? This Council will only be making the decision about moving forward. The new Council that will be seated on April 20 th , that Council will be the one that will decide about negotiations or anything else.
Paul Ybarra	<p>If on April 8th a majority of this Council decides continuing with the application for the Lake Michigan diversion, that just means we're exploring this option and directing Lori and Dan to start negotiations with a contract.</p> <p>We don't know how much grant money we are going to get, how much the pipeline is going to cost, how much the water is going to cost. Right now those are unknown because this Council has not directed anyone to negotiate a contract. The best thing you can do is come back to this Council and public with estimates. If we look at Option A do we have to stop looking at Options B, C, and D?</p> <p>So, those contract negotiations come back and there are terms and conditions that we can't live with—this Council or the next Council will vote yes or no. If that makes sense, we continue, if not it's Option B, C, or D. We still have to get the agreement of the Governors.</p>	<p>Lori— What I would anticipate is in one of the Council meetings immediately following that decision being made going to Closed Session to establish the parameters upon which we would begin formal negotiations with the 3 providers. We will establish the playing field and then have periodic updates with the Council similar to the process we follow when negotiating other contracts and agreements. The application would be reviewed by the DNR. There will be give and take in regards to additional information they will be seeking. I anticipate this will be a relatively lengthy process in which Dan and our consultants will be responding through the EIS process and we'll keep the Council involved and at the point that we have an agreement with the provider that we are prepared to bring back to you for consideration, that will require a formal vote of the City Council. This is beginning of multiple decision points, but this is the first and most critical point in determining what options we are going to have as we move along.</p> <p>Absolutely not. In fact, I think the Water Utility for years and years has kept a multi-faceted approach in that they're identifying multiple ways to solve the problem and as we are required by law, we are looking at the feasibility of the cost of these solutions and it was our intent to provide the council with an overview of the estimated cost so you have an idea moving forward of what kind of magnitude of a project are we dealing with here. We're dealing with a project in the magnitude of \$164 million. This is clearly the most sizable, substantial, potentially, the most important Public</p>

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Question by:	Question	Answer
		<p>Works project that the city is going to be considering. We want to be very clear about the size and scope of what this means to the community.</p> <p>Setting off the next step—actual design, easement acquisition, and engineering has to occur—multi-year process. (Canadians do not have a voting right—they are allowed to provide input).</p>
Rick Tortomasi	Thank you to everyone. This is a process and it's a long process. This is only an application to see if there's a potential source of water. We are not committing to anything at this point.	
		<p>Dan—I just want to make one clarifying point with regards to the Supreme Court's decision. It applies to Illinois as it relates to their diversion and not Wisconsin. But it does show that getting off the groundwater for lake water is considered to be good public policy.</p> <p>Mayor— Thank you. The next step is March 18th, 6 pm in the Council Chambers, will be our Water Utility Commission meeting where this item will be dealt with again. Then the next step would be the following Common Council meeting on April 8th at 7:30 p.m. in the Council Chambers.</p>

SUMMARY

Question	Answer
<i>1. Need for Water</i>	
What is surface water features?	<i>Dan</i> —Wetlands, rivers, streams, lakes are considered surface water features
Provided you are getting approvals for Great Lakes water, when does Engineering start to get the water here and return the water?	<i>Dan</i> —We've also had meetings with the other communities that we'd be potentially returning the water and we have made them aware of potentially what our intent is. With regards to the engineering, it is a long drawn out process no matter which way we go, and once we receive approval for a Great Lakes application, then there's going to be PSC/WDNR in our review of the project. Once we get the approval and once we know we're going to move forward, the engineering will start.
Explain why some of the water is 98° at the bottom of the deep aquifer and why it can't be used.	<i>Dan</i> —Within the aquifer, there's a number of different strata that you draw the water from and some of the water that we pulled from that aquifer was as high as 98° F and as a result of that, we had to abandon those portions of the aquifer. Before I came to Waukesha, there were some wells that had higher dissolved solids in the well, so what you have to do is fill the bottom of the well and abandon that portion of the well so you're not using that portion of the well to reduce the total dissolved solids. At 98° it would be aesthetically non-pleasing to the customers so you have to abandon that portion of the aquifer that's putting out that water. That also reduces the volume of water that you could pull from that well because the volume of water you can pull from that well depends on the number of feet that you have available to pull water from.
There's a map of the water service area as defined by SEWRPC and I'm assuming that this is made up of the 20/20 land use plan for the city? Does it extend beyond what that was?	<i>Dan</i> —What SEWRPC did is they defined our service area. Then we asked SEWRPC to tell us what the ultimate population will be of this service area at build out. They looked at the service area and on the map they identify what's already developed, which is in blue and they look at the environmental corridors which are green and the grey areas which is the land that is available for development. The service area that we have is 85% developed. There's only 15% of land available to be developed in the future. So SEWRPC defined the available land for development and projected a population based on the ultimate land use of that area as how it sits today and I believe it was based off of the 20/20 plan.

SUMMARY

Question	Answer
2018—seems like a long way out, but if there are any delays in the approval process or any kind of legal challenges to accessing or getting approval for utilizing Lake Michigan water, that's going to delay any contracting for design and construction purposes, so none of that is going to take place until this is already to go. Correct?	Dan —Correct. If you remember the timeline that I had there was about an 18 month buffer that would be available for any legal or construction issues that came up. It's important that we move this process now and start moving forward so we can get to that point where we can select the new water supply. Mayor —We are estimating just the process for this application to take one year. We're estimating 5 years even if we were successful to design, build and implement.
Have the scientists been able to tell us how long it would take to regenerate the deep aquifer, if we were to do the Great Lakes supply and give the deep aquifer a rest.	Dan —The scientists have indicated and the only statistics I can give you is that everyone gets off the aquifer it would recover 50 or 70% in 7 years and 90% in 9 years. Tony —that would be the best case on exactly how many years it would take.
Do we know all this as it applies to the City of Waukesha?	Dan —We know if we get off the aquifer it will start to recover.
I'm concerned about the baseline of the assumption regarding the population growth and the continued expanding of the city boundaries. You sited that you have 31% reduction in the water use with 18% growth. I think you would have had 47% reduction without the growth. I really wonder if you considered how you meet the radium problem with a baseline of the current population, because I don't see a reason to keep expanding and the real need for growth. I don't believe the SEWRPC numbers for growth.	Dan —State law requires us to determine what our water service area is going to be. It also requires us to accommodate growth—that's the state law that was within the implementation legislation for the Great Lakes Compact. We looked to SEWRPC as the regional body which is given the authority under the state statutes and we looked at the regional body to determine what our service area would be. SEWRPC went and determined what that service area is and did projections of what the population will be within that service area. That service area is intended to grow from the current of ~70,000 people to ~97,000. Over the length of this project period, that's less than 1% of growth. It's a reasonable growth and the compact and legislation requires us to accommodate growth. So that's what we did within our projections and that's what we looked at in terms of our future water supply in terms of how much volume of water we're going to need. Under all the alternatives, we're looking at the same volume of water which is 18.5 million/day. Under all the alternatives we looked at, previously we were requesting between 22 and 24 million gallons/day because of what our projections were terms of water use. That was prior to us implementing a conservation and protection plan. Now that we've implemented that plan, we've had success over the last years. We've seen that success. We're comfortable in asking for a lower volume 18.5 mgd and we'd be able to accommodate that growth within 18.5

SUMMARY

Question	Answer
	mgd. That conservation program will play a role in servicing our customers in the future.
The introduction your application says the City of Waukesha is applying for Great Lakes water to secure a sustainable reliable water supply that is protected of public health and provides regional environmental benefits. I think that's a good statement, but strike the word sustainable.	
Waukesha is going to increase the daily maximum use of water which is ~9.9 mgd to 18 mgd. We're essentially almost increasing by 100% that water that's asked for. When the population is only expected to increase 25% based on what I read on the report from about 68,000 to 85,800 people between now and 2028. I'm trying to wrap my head around 25% increase in population, 100% asked for increase in water and why that should be the case especially since Waukesha's doing a lot of work—especially in water conservation as well.	
I'd like to know how we came up with a doubling of our water consumption if our population is growing ~10% over that time period.	
Our second major concern is whether the quantity of water Waukesha's requesting is reasonable.	
I think a lot of the language in the application pertaining to conservation in particular seems to be pretty weak and without any numeric or hard goals that have to be met by a certain time.	
How much of the water is needed for growth, how much to sustain the folks, the businesses, the uses that are already here? I think you need to lay that out and why you need the numbers you're seeking for each of those components.	
Environmentally sound and economically feasible water conservation—just saying you're going to have and going to continue the programs you have—I don't think is going to cut it. I think the other governors are going to be looking for a lot more than that. What are the goals? What are the enforcement methods?	

SUMMARY

Question	Answer
2. Water Supply Alternatives	
How big is the water pipe for inflow/outflow—redundancy?	Dan —Size of the pipe to supply the water has yet to be determined. Intent with regards to redundancy, is to continue to develop the shallow well fields we have and maintain the shallow wells that we have in our system, that would be as redundant back-up in peaking supplies so that would be available in the event of a catastrophic failure on the pipeline itself, that we would be able to turn on those wells, provide more water supply and fire protection to the residents of the City of Waukesha while that is being repaired. As far as the return flow pipeline, again that has not been sized as of yet.
Will there be a redundancy on return flow?	Dan —There will not be a redundancy on the return flow. The back-up to that would be in the event of a catastrophic failure or something happening on that line, the discharge would be to the Fox River until the point in time that we repaired that pipeline and could send the water back.
What would happen if there was a pipe breakdown? Would we be able to use our current wells as back-up?	Dan —The intent would be to maintain the shallow aquifer wells (abandon the deep aquifer wells) and have those in operation for emergency and back-up redundancy.
Will WWU treat the water that comes from Lake Michigan?	There will have to be some type of touch up treatment—mainly chlorine will be added to maintain the chlorine residual throughout our distribution system. No other treatment that would be necessary other than the wastewater treatment at the end of the process.
Will we have a chlorine taste in the water?	Taste of chlorine means the chlorine is actually reacting with something that's in the pipes. As long as we flush and maintain our system, we shouldn't have that problem within the City of Waukesha. Well water retains a lower residual than on surface water.
WWU regarding Milwaukee concerns on cryptosporidium	Since the outbreak ~10 years ago, it made an awareness of the water and provided the incentive for everyone to treat water to the fullest extent as possible. Milwaukee has installed an ozone system that does take care of the cryptosporidium issue and treats the water to a much higher level where they've been recognized on the world level of the high quality water they put out in their system. Relocated their intake out of the zone of influence where the discharges were that provided the contaminants into their influence stream. They addressed the problem from the influence standpoint and from a treatment standpoint.

SUMMARY

Question	Answer
<p>Are you trying to identify existing corridors on getting the water here and returning it? A lot of potential for going over private property to get the water and get it back</p>	<p>Dan— From a preliminary design perspective, we have done some preliminary investigations in regards to corridors that are available for installing a pipe, as is SEWRPC involved from their preliminary design water supply plan and there are corridors available for us to potentially take a pipeline down. We have talked to some people that are responsible for those corridors and there is interest there.</p>
<p>What is “old” water? Using deep wells now, are we running the risk of tapping into old water today?</p>	<p>Jeff—Water that has been in the aquifer for hundreds if not thousands of years. Different from a shallow aquifer where it’s much more recent water that’s entered the system. Old water is just a term that it’s been in the ground for a long time. Only health concerns are if you go deeper into the ground. Dan—As we pull down further and further, the water gets older and that’s where you run into the salinity issues and the more brackish water issues.</p>
<p>Annual O/M budget being that the Utility is going to be relying on existing systems for redundancy, will there be cost savings to the Utility if we go with Plan A or B or will the Utility simply have to maintain their existing systems at the same level as they are today in the event of an emergency?</p>	<p>Dan—There is going to be cost savings when we abandon our deep aquifer wells and that’s because we’ll be abandoning the treatment for those wells, as well. When you’re pumping from 2,000 feet deep it’s a lot different than from pumping from 140 feet deep. We’d put the shallow wells on a regular maintenance schedule like we do now with our wells that are not compliant with the radium standard. We do have the ability to turn them on in the event of a catastrophic failure/emergency. With regards to the treatment process, the reason you don’t maintain that treatment process is because you can’t turn that on/off. We can’t store chemicals for a long period of time because they’ll degrade to point where you can’t use them.</p>
<p>Is there any consideration or talks about combining with what New Berlin is doing to possibly piggyback/combine engineering to eliminate the impact on the flow both ways?</p>	<p>Dan—With regards to New Berlin, the return flow is connected to MMSD, so we wouldn’t combine with them. We did have conversations with them on the water supply with regards to their route, however, the path that they went through to get the volume of water that they needed is different than the path that we would need to go through to get the volume of water that we need. They take about ¼ of the water that we need so we’ll need a much larger pipeline than they needed for the entire city of New Berlin.</p>

SUMMARY

Question	Answer
<p>With regards to our service area—how locked in would we be to a service area and how easy would it be to amend our service area in the future?</p>	<p>The water service area would be locked in when we applied for the Great Lakes. We would not be able to supply water outside of that area without going for an amendment and that amendment would include getting permission from all the other Great Lakes governors. That's why we asked SEWRPC to define the "ultimate" service area for our water service area similar to what they did for our sanitary sewer area.</p>
<p>What are the total capital costs? What is inclusive? Alternatives for return flow—Is it based off of a specific supplier? What is the variability in the supply line cost if we went with another supplier? Order of magnitude—are we talking more or less? Is it fair to say regardless of the community that would supply the water, that the overall recommendation regarding all of the alternatives we've evaluated the fundamental conclusion that most cost-effective alternative, being Great Lakes Water, would remain intact regardless of the supplier?</p>	<p>Dan—Capital Costs were \$116 million included the O & M for 20 years. That included the present value of the O & M. The capital costs associated were \$56 million. The modifications to the wastewater are included in the return flow—the \$22 million. Total capital dollars are \$56 million plus \$22 million for the return flow pipeline = \$78 million. The \$22 million capital is based off of Underwood Creek. It would increase from there to the Root River or MMSD. The return flow would be done independent of what community provided us with the water. The specific supplier is based off the City of Milwaukee. I believe it's \$15 million, but I'm not sure. I wouldn't say regardless of the supplier, because there are a number of different factors that come in to play with that. It would depend on the contract negotiated and what the cost of the water is and what the hook-up location is in terms of where we get the water from. In terms of who the supplier is, there are a number of variables that come in to play with that that would then fall into what we negotiate the contract is. To whether the Great Lakes supply or the western well supply would be the most cost-effective.</p>
<p>Do you see anywhere in the future a possibility of using well water with pumped water from Lake Michigan and supplementing it so we don't have to take as much water from Lake Michigan?</p>	<p>Dan—This would fall more into our Operating Plan. It's very difficult to mix water chemistries of well water and surface water. Only potential would be for peaking capacity. A lot of times there will be limits on the volume of water that you can take at a specific time, so when you are getting to that threshold, you would turn on the wells with a knowledge that most of that water is going to end up on the lawns. In the event of a catastrophic failure of the line bringing the water to Waukesha, you would be able to provide your residents with a water supply and fire protection.</p>

SUMMARY

Question	Answer
If the Lake Michigan diversion is \$116 million and the shallow wells are \$145 million, isn't the true cost \$261 million if you are using the shallow wells for redundancy?	Dan —No. The shallow wells we are referring to would be a new shallow well field that we'd develop outside of what we have and outside of what we're currently planning to have.
What is the planned pipeline routing to and from Waukesha? Has there been discussion, preliminary negotiation with jurisdiction with path of the plan—possible return flow routes?	Jeff —It would come from the west side of Milwaukee using existing rights of way. It would be approximately 10 miles in length and come in from the north—around 92 nd and Howard. Dan —There is an east west corridor we have identified and that's been identified in the SEWRPC Plans also and as far as the details of getting the pipe to and from that corridor—those routes have not been identified at this point. Mayor —We have not had any negotiations with any jurisdictions. We have had informational discussions with the Mayor of Milwaukee and some of the members of the Milwaukee Council. We've had discussions with the Mayor and some of their staff for Wauwatosa, West Allis, Racine, Oak Creek, and the Village of Elm Grove. Our plan is once the application is made public we would have more meetings. Dan —I believe there is a second alternative that would be around the Zoo, but I'm not exactly sure where that is. The finalization of any route will have to be approved by the WDNR.
Is there actual data documentation and actual reports showing how WWU Commission studied the alternatives to diversion?	Dan -The following reports are on our website "Our Future Water Supply Study", S E H Study at www.ci.waukesha.wi.us/water utility . Volumes of information are also available at the SEWRPC website with regards to the analysis that was done.
With alternative #1, the treated water pipeline that would go from the proposed well field in the south all the way up to the Hillcrest Reservoir & Booster in the NE part of the City—explain why that pipeline is needed.	Dan —These numbers include distribution system improvements that will be necessary within our system to distribute water throughout our system. Right now, by putting that water to the south and the need to transfer it throughout our system, our system isn't built like that now, we need to install the improvements to move that water throughout the system. All 3 options include those numbers to make it equal (apples to apples).
Alternative #1 would need system improvements to get the vast majority of the newly treated water up to the north and east part of the city to let it flow through the existing distribution system. Correct?	Dan —The Hillcrest Reservoir is one of the main distribution points in our system. It's at a high point and it provides the water that moves throughout our central zone and then it gets distributed from that point to the northwest and southeast.

SUMMARY

Question	Answer
<p>Another question in regards to the alternatives—in terms of Alternative #3, which would be Lake Michigan, we've put out letters of intent from Racine, Oak Creek and Milwaukee for potential purchasing of water. Where on this diagram—which municipality does this represent?</p>	<p>Dan—This particular diagram represents the City of Milwaukee.</p>
<p>If Great Lakes is the ultimate option that's chosen by this council, if another municipality besides Milwaukee were chosen, would this diagram change? Would the route of the pipelines be different than what's articulated on this alternative?</p>	<p>Dan—The east/west pipeline remains approximately the same and it breaks off from there where it would go towards Oak Creek and towards Racine. It would basically run the same in Waukesha County until it hit the Milwaukee County line and then it would move to the south and to the east.</p>
<p>You had mentioned that Alternative #1 and Alternative #2 are not sustainable. Your concern is 20-30 years we would have to do this all over again. Can you expand on that point and explain why you feel that way or what would happen in 20-30 years that would cause these</p>	<p>Dan—There have been a number of studies that have been done. In fact, SEWRPC has done about a 2 year study with regards to the water supply for the region and they came up with the same conclusion that the City of Waukesha should go to Great Lakes for water and there was a panel of 37 water experts that sat on that review committee and came to the same conclusion, but under that scenario, what was developed was a look at the shallow aquifer and there was a model that was created and an index that looked at the shallow aquifer to the south of the City and what would happen if you took 3—4 million gallons/day from that aquifer. There was a base flow reduction index that was created—you would reduce that by about 50 percent. We're not talking about ultimately talking about taking 3—4 million, we're talking about ultimately taking half of our water and so we have to model that and it would be above that 50 percent mark, so you would be having severe environmental impacts adjacent to that area where you would be drawing down that aquifer for long-term. The other thing, during a serious drought condition, the groundwater goes down as a result of that drought condition as does the flow in the Fox River. So under either scenario during that drought condition, you are going to additionally stress and already stressed resource. Tony—There are other people on these aquifers, too, not just Waukesha. So as they grow in the future, it's more water coming out of the same water source.</p>

SUMMARY

Question	Answer
<p>We purchase water either from Racine, Oak Creek, Milwaukee will we be at their mercy? Can you explain the process as far as the regulation that it's simply about the water.</p>	<p>Dan—In the State of Wisconsin, the utilities are regulated by the Public Service Commission and the way they set rates is they do a cost of service study. They look at your utility and what it costs to provide service to the customer class. We would be considered as part of a customer's class from any supplier and that customer class would be the wholesale customer. For instance in Waukesha, there's the industrial class, residential class. They break those out and look at what it costs to provide that service and they allow for a certain rate of return on that so the utility can invest back into their infrastructure and the PSC will not let you set rates higher than what that cost of service study dictates and the rate of return you will allow. While a water supplier might say, we want to double your rates, but not their rates; they wouldn't be able to do that. The PSC would not allow that and if a customer wanted certain payments or whatever, the public service commission has ruled that they will not allow that to be as part of it. As part of the regulatory process, we'd have to go in front of the regular PSC and they would have to approve the rates as a regulatory body.</p>
<p>Whatever option we decide and if it is Lake Michigan water, no matter what municipality we would seek it from, they can't impose any type of fees just simply to make up their budget so their budget balances. Correct?</p>	<p>Dan—Correct. If they had a deficit one year and they wanted to make it up through the water rates, they would not be able to do that. Like any other Utility does, they'd have to go through the rate process and justify those rates in front of the PSC. Mayor—The negotiations for any agreement would be lead by Dan and Lori Luther. They would be entering into negotiations on behalf of this Common Council. Any type of agreement would come to this Common Council for a public discussion and would not go into effect unless this body ultimately agreed that the negotiated conditions were acceptable.</p>
<p>Could we conceivably run out of water in this aquifer in 30—40 years?</p>	<p>Dan—No, we would probably not run out of water, but the water would have more contaminants and we'd have more treatments that would be necessary. The study we went through looked at treating the deep aquifer water, treating the shallow aquifer water and those are the other numbers that identified as the other alternatives in here providing that treatment. The more and more we utilize this aquifer the more and more the drawn down gets and the more environmental damage that will be caused. We are west of sub continental divide, but we're within a straddling county.</p>

SUMMARY

Question	Answer
<p>Our population isn't exploding and we are using conservation more and more—we use less water now than we did 10 years ago per capita. Is there a possibility where we don't have to go with Great Lakes water? This is going to be a terribly expensive proposition because a lot of people don't realize is what water we take out we have to send back.</p>	<p>Dan—The other alternatives we looked at are just as expensive as or more expensive than the Lake Michigan option in terms of treatment costs and environmental impacts. Those costs are identified. Any route, I agree, we're looking at spending a lot of money, but any route we go, if we're going to be spending money and we have this court order by June 2018 and under that scenario the recommendation is to develop a new water supply. There will continue to be environmental damage and if we start moving to the shallow aquifer, there's going to be the drawdown in the shallow aquifer and those draw downs and environmental impacts are closer to where you are pulling from so they would be in the land directly adjacent to those wells. We have the iron, manganese and arsenic that we have to treat for with regards to the shallow wells.</p>
<p>With the long-term goal of Lake Michigan water supply for the city, is the city still pursuing an additional water supply via additional wells and, if that's happening, what is the status and cost of that?</p>	<p>Dan—As you are aware, we are looking at purchasing the Lathers Parcel where there's potential to install as many as 3—5 wells on that parcel and we're in the process of identifying other lands to the south to the east that would be in another well field that would be adjacent to potentially develop that additional shallow well field to supplement that.</p>
<p>Is there a 3rd possibility—east/west replenishing the aquifer and a multi-faceted solution over the next 50 years—has anyone looked at that piece?</p>	<p>Dan—That's a good question with regards to Lake Michigan and well option. The issue is you would have double the expense because you would have to build the treatment facility for the shallow wells and all the infrastructure to distribute the water, but you'd also have to build all the infrastructure from the Lake Michigan and the return flow. So, you'd have a higher expense if you looked at a combination. From the construction standpoint you would have an issue and from the water quality standpoint you'd have an issue because they are two different chemistries of water. I can tell you they don't blend very well, so we look at utilizing potentially our shallow wells in case something catastrophic happened.</p>
<p>Where would the water be treated that would be extracted from Lake Michigan?</p>	<p>Dan—All 3 of the communities have water treatment plants that exist along the lake. Oak Creek and Racine each have one and Milwaukee has two. They would treat it at their facilities. The wastewater facility that we have currently in the City of Waukesha would continue to treat</p>

SUMMARY

Question	Answer
	the wastewater to the standards that it has already existing in its permit and where we discharge to the Fox River. We would be looking at changing our discharge permit and location from the Fox River to Underwood Creek. Great Lakes water would be treated at an existing facility along the lake that has the available capacity to provide the city of Waukesha with their water and then the wastewater facility would continue to treat the wastewater and we'd change the discharge location.
Would Oak Creek have the capacity to treat the quantity of water this city would require?	Dan —Both Racine and Milwaukee have ample available capacity to provide the City of Waukesha with the water on its max day the 18.5 million gallons that we are looking at requesting. Oak Creek has enough capacity to handle the request we would put in right now, and they have enough available capacity within their infrastructure at their treatment plant. They'd have to add on some treatment processes to allow us to provide water on our maximum day when we reach that 18.5 million gallon threshold.
There is a perception amongst some people in this community that are a little queasy about getting Lake Michigan water from the City of Milwaukee due to their cryptosporidium situation about 10 years ago. I did speak to you about it about 6-9 months ago, but the perception is still out there. That's why I asked where the water would be treated (double treated) to make sure we don't get this cryptosporidium. I know you've explained to me that they've improved their water purification system, but the perception is still out there and I'm concerned about that. Please elaborate this improved system that they have.	Dan —Since that event that took place in the City of Milwaukee they've installed an Ozonation System that provides as a barrier to the cryptosporidium virus and also provides a barrier for another of other things that are out there. The City of Racine also had an incident and they had since installed a membrane treatment that polishes off the water. Basically, they treat their water and put it through a membrane system as another barrier. One thing I'd say about the City of Milwaukee since that outbreak, they have improved their system dramatically and they were recently recognized as having the 19 th best water amongst large communities throughout the country. They have very high quality water and they're run by a very qualified manager.
It seems to me the greatest cost is going to be the return water. A lot of people aren't aware in this community that water we take in we have to bring back. That would include, I assume, everything that our sewage treatment plant treats, correct?	Dan —The compact calls for you to return the water minus a consumptive use. We would be looking to meet the requirements of the compact on an annual basis and looking on a 5 year rolling average of having a goal of returning 100% of the water to the Great Lakes basin so it is more sustainable for the long-term. That's what makes this more environmentally sustainable for long-term is that you are recycling and reusing the water that you utilize for your citizens rather than having it sent down to the Fox River and it's lost forever.

SUMMARY

Question	Answer
Do you have any idea of what costs we're talking about as far as all this pipe that would be required?	Dan —The cost for the return flow and the supply are included in the numbers that were provided for you, so the return flow is also included in those numbers and the Great Lakes option is the cheaper option. Tony —For the Lake Michigan, the total capital cost was \$164 million, about 30 percent of that is for the return flow. There's a little bit larger portion for the supply from a Lake Michigan utility and there's also some of those distribution system improvements we talked about to move water around town.
In regards to the legislation issues, if there is no legislation, why can we not return water to the aquifer?	
If we're pulling it out, why can't we return water to that as far as the sustainability goes?	
If we're concerned about sustainability with Lake Michigan requiring us to recycle it, why can't we use that same process with the aquifer?	
I have a question on the analysis for the maintenance—did anybody include costs that are going to be associated with that Milwaukee resolution in the maintenance budget? The way I look at it, it cost up to \$2 million a year if they go by the one Cleveland has in their report—\$200,000 for 2.5 million gallons p/year. If we're going to take 20 out of there, that's 8 times the amount.	
What is the challenge in regard to SEWRPC's findings concerning sustainability for the shallow aquifer?	
The water reuse from the affluent instead of using the renewable source. To what depth did you look into this?	
Alternates all look really good—one thing with Oak Creek and Racine, they use a filtration—membranes. Did we look at that here in Waukesha?	
If the only problem with our water is the radium, you can install a filter in your home to take this out. Why doesn't the Water Utility filter that out?	
What is the cost and can this assistance be applied to this?	

SUMMARY

Question	Answer
You do it in your house, so why is it not being filtered out before it comes to our house?	
If it can be, will the cost that you have here on this sheet be applied to this?	
Why are new shallow water wells required and the financial impact that they will occur to the residents of the City of Waukesha and what will the City do to ensure that the new shallow water wells on the Lathers property—what will the City do to ensure that those wells will not negatively impact the Vernon Marsh and its aquifer?	
The request is if you would be able to put on a line a more specific breakdown of the cost estimates of each of the alternatives, so we know what's in those numbers—we'd have a better idea of what the cost breakdown is for each of those. My questions is—I'm still trying to get my head around the daily demand calculations and how those were determined.	
Why can't we filter the radium out of the water as the water is now?	
Why can't that be done rather than applying for water from Lake Michigan?	
What steps would you need to take to make the water usable?	
Can you tell us what steps have been or will be put into place to make sure we wouldn't have this type of problem again if we were to get water from Lake Michigan?	
If we continue to draw down on the shallow wells—for example, the wells south of the city, what would be the affect on the Vernon Marsh as well as septic systems and wells of homes in that area?	
And likewise, what would be environmental impact of drawing down on the Fox River?	
What would it take to make that water usable?	
How do you respond when someone says the majority of homes in Waukesha already have water softeners to take care of the radium?	

SUMMARY

Question	Answer
How many municipalities currently get their water from Milwaukee and are they having any sovereignty issues at all?	
Have there been any studies to show what the cost of removing these pharmaceuticals —should that come down the line as being required to be removed as well and what costs will be passed on to the residents of Waukesha regarding the removal of those items?	
If you're adding in that cost as something that's going to save these people all this money and reduce the cost per person per household, and you come to find out later that we will be dealing with chloride rejection, how is that going to affect the cost/person in the end on that?	
We believe that several valid alternatives that were discounted were probably discounted prematurely and a combination of some of the approaches from the 2002 study really could be combined and looked at and that could have some merit including looking at the unconfined deep aquifer to the west, re-injection options, groundwater inducement, enhanced conservation, etc.	
One of the bigger questions we have is the application states that the deep unconfined aquifer west of Waukesha wasn't really looked at because SEWRPC made an assumption that the groundwater source had to be within one mile of Waukesha's Utility service area. I think there were also concerns over public nuisance that's mentioned in the application and that seems to not make a lot of sense given that we're now pursuing a Great Lakes diversion which is 7 miles away and also has its own suite of regulatory and legal issues.	
In all fairness, when a suggestion is made to explore an alternative, that should be given a full public airing with—it's going to cost \$32 million more, but what of it is going to cost \$32 million and how did you come up with \$32 million. In fact, how did you come up with \$174 million? About 4 weeks ago it was \$164 million and somehow it crept up to \$174 million last week.	
3. Return Flow	

SUMMARY

Question	Answer
Return Flow Options Costs—Difference between Underwood Creek and the Root River O/M costs.	Dan —Major difference is the distance it's going to have to move.
Regardless of the community that would supply the water, is it safe to say that the amount of water that can go down the river (-- i.e.—Underwood Creek) even in the most extreme cases, the ultimate dry weather we would still have some water going down a return flow alternative rather than everything going back to the Fox River or vice versa. Would there always be return flow? There would be certain conditions where some would be going in both directions?	Dan —In that situation we would most likely have our average day demand minus our consumptive use going back which is what's allowed under the compact, and the remainder going to the Fox River. What we look for is to work out that final operations plan is going to be with the DNR and how exactly they would want to handle those extreme scenarios. There would always be return flow. The other condition would be the wet weather condition where we have a 100 year rain event where our wastewater facility is treating more water than we would see on that average day. We would scale back the volume of water that we send back to the average day minus the allowance of consumptive use to minimize the perceived impacts that there would be to the Underwood Creek or the Menomonee River. At that point, you would be sending 7 or 8 cubic feet per second when the stream has 1500 cubic feet per second, so it would a small fraction of the amount. (I'm just using those numbers as an example.) There would always be return flow that would meet the requirements of the compact going back to the Great Lakes Basin.
Clarify the analysis that has been done pertaining to the environmental benefits to Underwood Creek, as an example; share with us an analysis which we may have done on the other side with regards to Fox River/Vernon Marsh relative to less water coming into there from our wastewater plant pertaining to normal daily flow.	Dan —There has been analysis done, we've monitored and we've worked with the wastewater utility with regard to what their flows have been throughout going back 15—20 years with regards to wastewater discharge and wastewater flows and looked at some of the gauges within the Fox River and what that impact would be to the Fox River and downstream to the Vernon Marsh. We are still working on that analysis and SEWRPC has also looked at that analysis. This is something we would bring back at the December or January meeting. Jeff —The Vernon Marsh is fed by the Fox River primarily during the flooding events. Those are still going to occur and the utility's treated wastewater doesn't really impact that. In terms of the streams that are feeding to the Vernon Marsh, those would be directly affected by pumping from a well over a long period of time.

SUMMARY

Question	Answer
Is it possible to have 100% of return flow to Underwood Creek?	Dan —We have done a lot of analysis on the volume of water that is available for return flow and I believe it's about 20% more than what we utilize on average treated by the wastewater facility. There's been mixed signals from a lot of different groups, as to what that amount should be. The compact says you need to have return flow minus an allowance for consumptive use. It doesn't mean we wouldn't have a goal for reaching 100% return flow, but what is the law is return flow minus an allowance for consumptive use. Jeff —The compact actually says you need to maximize the amount of water returned back to the source water shed and you have to minimize the amount of groundwater from this basin to Lake Michigan. You want to create a water balance. The improvement isn't so much in the quantity, but the levels and the flows and quality that would go back. We're providing additional level in the stream for fish passage and also for potential water quality improvements. On the wastewater side, infiltration and inflow is a bad thing. We've met with our Director of Public Works, Fred Abadi, who made us aware that they're entering into programs to minimize the amount of infiltration and inflow that they have.
Would the return flow still go to Underwood Creek or would it go back towards one of the municipalities it chose?	Dan —We are proposing that the return flow would go back to Underwood Creek under any of the 3 scenarios.
Nobody has addressed—if you're talking about dumping into Underwood Creek, which means we're going to have to get permits from MMSD. Is that going to drag us into MMSD?	
Looking to return the flow in a 5 year rolling average and what that means?	
I'm concerned about the Underwood Creek as the discharge point for the wastewater. Maybe we'll resolve this later. Underwood Creek has just been listed -are on the drafted list of 303 D list. That's EPA's fancy term of saying an impaired waterway. We have many impaired waterways in Wisconsin; this one is just about to be listed. When it's listed, then there's developed a TMDL or a plan to improve the water quality in that creek. I think we need to wait to find out what that TMDL plan is going to say so we know that our additional discharge to Underwood Creek wouldn't require more treatment of your wastewater.	

SUMMARY

Question	Answer
<p>We continue to be concerned about lack of return flow alternatives, although several alternatives were looked at in the application in the general sense, it's clear that the City's only conducted really a meaningful analysis of one being Underwood Creek. We would expect that the EIS would have more information as far as looking at a thorough analysis of return flow alternatives and the environmental and economic impacts of each one of those.</p>	
<p>Given basically the possible impacts on both the water quality and the quantity of Underwood Creek in Menomonee River, we feel that an impact statement should ensure that there are no other reasonable alternatives and that any return flow scenario is protective of the physical, chemical, and biological quality of the streams that are potentially impacted.</p>	
<p>I think by the appendices we continue to have concerns in particular about the bacteria loading that would be coming back into the creek.</p>	
<p>Every engineer, every DNR person will tell you that that is a bad thing to have a lot of inflow and infiltration going into your sanitary system.</p>	
<p>Return flow—the compact calls for all used water to be returned back to the Great Lakes basin less the allowance for consumptive use at a place as close to the place at which the water is withdrawn. I've not seen an explanation for why Underwood Creek is as close a place as one could be from where the water is coming out of the lake.</p>	
<p>It appears, at least upon first look at what you're proposing that this is going to be a new discharge to Underwood Creek. Underwood Creek is an impaired waterway for bacteria. There are a number of recent court cases under the clean water act that make it extremely problematic at the best, for an additional loading of a particular pollutant that's the reason a water way is declared to be impaired.</p>	

SUMMARY

Question	Answer
<p>4. Compact Compliance</p> <p>Timing of application coming from the City and when is the ideal time with regards to rules and regulations that individual states are drawing up?</p>	
	<p>Mayor—The compact, when it passed the WI Legislature, had about 175 pages of implementing language. Our application will follow all of those details that are there. In our discussions with the DNR they’ve said that at some point they will be writing rules, but we do not need to wait to move forward with an application for those rules to be written. Dan—I participate on the Groundwater Advisory Committee and we recommended groundwater quantity legislation and as part of that—laws were passed and implemented and rules were not made, but that did not mean that people stopped applying for well permits throughout the state. The DNR, while we were in the process of developing rules, they still processed applications and approved high-capacity well permits for people that did apply. Mayor—Bottom line is we do not have the luxury of waiting because of the settlement with the Dept. of Justice on the radium compliance because we either have to be successful with the Great Lakes water application by the middle of 2018 or we have to move forward with our alternative. The first example of a community getting Great Lakes water, which is different than what our application is going to be, is New Berlin. They are a straddling community where half the community is in the basin and half is out. They had to get approval from WDNR, but did not have to go through the other 7 states. Their application had been approved even though the rules had not yet been written. Dan—The DNR is estimating about 4,000 hours that it would be required with regards to developing the rules. The first presentation I gave to this Council was in 2004 when we talked about a future water supply and the implementation of that water supply on the original timeline I had 2010 as the goal. 2010 is in a few months and we still haven’t even started construction. As we move to implement this, it’s going to take a number of years. We estimate about 5 years from starting to acquire the land through the easement acquisition process to actually constructing it and putting the infrastructure in place and then turning it on.</p>

SUMMARY

Question	Answer
Agreements for seeking water from municipalities—are there anticipated problems with return flow politically with communities? How is that being addressed?	Mayor —In terms of the process from other communities, the first step will be at the October 20 th Council meeting to ask the Council to make the official request. If we're successful in getting 3 letters of intent, we've been upfront that Milwaukee is our 1 st choice both for financial, as well as regional cooperation reasons. There will have to be negotiations similar to what New Berlin did, which is an amount of money we would pay any community on an annual basis, as well as a possible sum to complete an application. Negotiating with any community has political issues. I don't know if there are any political issues in terms of return flow, we've been working hard and that will be part of the application to detail explain how the return flow will occur.
Regarding the Compact—do you see anything in the compact that would allow the selling municipality to dictate other things in the municipality other than water? (--i.e.—housing/transit, etc.) making us change other things we do in the City other than to do with water?	Dan —There is nothing in the compact that requires that.
You had mentioned that any other annexation beyond this border would have to go back through the whole process again for water service which would be outside of the service area that we're applying for. Correct?	Dan —Correct. Just like the sewer service area of the plan, like when the city looked to provide service to the City of Wales, they had to amend their sanitary sewer service plan, and they had to go to SEWRPC to amend it, we would have to go through that same criteria on the water side.
So it would be just a basic looking at the agreement and doing an amendment? Even if we weren't going beyond the volume that we planned because we had set borders?	Dan —In terms of water supply, with regards to Great Lakes water supply. If we wanted to take and square off this area and add a bunch of acreage to this, in order to supply that area with water from the Great Lakes, we'd have to go back to the DNR and ask for approval and they would have to go to the other Great Lakes governors and ask for approval or an amendment to our service area. We would have to go through the whole process again. That's part of the legislation that you have to identify your water service area and that's what we did when we went through this process with SEWRPC.
If and when we apply for the Great Lakes water and our application is accepted, but we decide not to move in that direction right now, does the application expire if we don't begin construction in x amount of time?	Dan —I do not know the answer to that question, I'd have to look into it and get back to you.

SUMMARY

Question	Answer
Is there any legislation requiring the return of water to a particular watershed like Underwood Creek? Is it required by State Statute or legislative requirement?	
Depending on how the Great Lakes compact is written, is there any type of language in it should Lake Michigan's water level reach a particular stage that the water supply is shut off?	
What happens if the Great Lakes Governors council turns down the application?	
Does your timeline incorporate that type of delay that's already been predicted by an expert speaker?	
How will this application reconcile the SEWRPC preliminary findings in that regard with that requirement under the compact that will be evaluated at the regional level?	
Is the requirement that there will be no adverse environmental impact to the quality or quantity of the waters of the Great Lakes basin?	
Again, with the DNR's requirement of a comprehensive environmental impact statement, how will that be addressed and how can that information be brought before the public and before yourself to assure that that component of the compact is met sufficiently so others around the region will follow suit when they make diversion applications that the bar is appropriately set?	
This application also needs to address the precedence issue.	
At the last open house someone made the statement that the draft application appeared to contain a lot of window dressing. Please comment on how you came up with the format and especially the content of the application.	
According to compact provisions, Waukesha needs to show that they have no reasonable alternative water supply and I don't quite feel they've quite fully made this case yet.	
Given that we really don't know which community is going to sell water to Waukesha, we still have a lot of questions about whether or not the application will meet compact provisions in terms of the closeness.	

SUMMARY

Question	Answer
Looking at the compact language and what's required in the diversion is I don't see anywhere that you need to talk about cost. What things cost. I don't think what the alternatives cost need to be in your application. Unless I'm not finding it somewhere in the compact, it says reasonable—based on public health, but it doesn't say anything you choose the least cost method.	
The question of unavoidable need. The compact is clear that the need for any proposed diversion cannot be reasonably avoided through efficient use and conservation of existing water supplies.	
It's not at all clear that Waukesha's application has considered all reasonable alternative water supply sources which is necessary. It is evaluated how much of the required diversion could be supplied by another combination of other sources.	
5. Other	
Will Waukesha be at the mercy of Milwaukee as far as pricing and costs?	Dan —The pricing and cost of water comes from the PSC and they do water cost studies that they have to approve. PSC does a cost of service analysis and they determine the water rates, the rate of return, and what they can charge you. PSC process will be on both the Milwaukee and Waukesha sides.
Preliminary cost projection—how will it affect each household in the City?	Dan —We're in the process of projecting out what the costs may or may not be. The Mayor, Water Utility Commission, and I are working heavily with the representatives in Washington to identify federal dollars that would be available to help assist us in our efforts to maintain the water and return it back to the Great Lakes. So far we've received just short of \$4 million from the federal gov't with regards to radium compliance. Now we're identifying other means that would bring in larger dollars to help offset those costs. Mayor —We're hoping we might know something about federal dollars in February. Dan —Meeting with our consultants in Washington and in Wisconsin with regards to the funding effort and we're identifying some programs. We'll be meeting later this month to look at those programs and discuss with our representatives and we're looking to go out to Washington in January to further those talks and, hopefully, get into some of those programs. We hope to have some of those answers prior to an application being made.

SUMMARY

Question	Answer
Keep CC informed of costs.	
How do you pay for this? At the very end of the day once we have received any funding, the ultimate cost of this (Plan A or B) will be left to the City of Waukesha. Correct? The City/Common Council will be the ones approving the borrowing for these funds. Correct?	Dan — As with any borrowing, it comes to this Common Council,
How much has the Green Bay cone area recovered over the last 30 years?	Dan —In the 1950's all the suburbs decided they were going to go with Green Bay, but then they decided to stay on the aquifer thinking there would be plenty of water. The aquifer did recover, but I don't know the exact percentage. 50 years later that aquifer was drawn down and they had the water quality issues that we're seeing today and what they did was switch to a Great Lakes supply. They were unable to come to an agreement with Green Bay during negotiations, so the surrounding cities of Green Bay went to Manitowoc.
The City of Milwaukee is trying to hit some of the outlying communities for certain costs that were never discussed in the past and the infrastructure.	<p>Dan—That was called the Ad Valorem Tax. The PSC plays a very large role in what they can and can't charge for water. There has been a move recently, which is what I believe you are referring to, with regards to city's being able to obtain more dollars from the utility's because of the fiscal crisis that is being realized by a lot of the cities. So some of the City's are trying to get more revenue from their water utilities. The City of Milwaukee has asked for in addition to their PILOT payment \$3 million from the Water Utility. They'd have to get it from somewhere, so they'd get it from their customers. Similar issues are being realized in other cities throughout the state and the PSC has not decided how they're going to deal with that issue. They are really frowning upon that issue. They don't want to see the water utilities become the cash engine for cities to operate. Mayor—Dan, isn't it true that any agreement that the City of Waukesha would reach with the City of Milwaukee, Oak Creek, or Racine come back to the Common Council before it would become an official agreement?</p> <p>Dan—Correct. Any agreement that we would enter into would be negotiated by the water utility commission and would then be presented to the Common Council with ultimate approval by the Common Council. Mayor—We purposely are being upfront about</p>

SUMMARY

Question	Answer
	we're looking at 3 possible communities and depending on the letters of intent and depending on our meetings with those communities over the next couple of months, that will depend on who we ultimately end up reaching an agreement with and any agreement will come back to this body for an approval prior to taking affect.
Has anything been verbally agreed to by the City of Waukesha?	Dan —Not that I'm aware of, no.
Will there be an opportunity for an open session process by the Mayor for the media, public, etc., to make comments, express their opinions?	Mayor—This meeting tonight we had set a goal to end around 9:00 because we felt with this presentation, until we're ready to present the Draft Application that are a lot of details that still need to be worked out. Our plans for the December/January meeting will have a starting time, but we won't have a definitive ending time, so depending on how many members of the public show up, we will come up with a process for people to make comments and express opinions. In December we plan to unveil the draft and have questions on the first draft depending on how that meeting goes will determine if we need additional meetings for questions. When the Water Commission has a special meeting to determine whether they're not going to recommend moving forward, we'll allow for discussion at that time, and as part of our regular Common Council meetings we always invite public comment.
Will costs of whatever route to a better water supply chosen be entirely on water rates or will any of it be on the City tax levy?	Dan —The bonding for water supply would be bonded by the water rates. The bond itself would have to be issued by the City of Waukesha and it would not be anticipated that any of the dollars for paying those bonds back would come from the City of Waukesha.
How much will property taxes go up as a result of getting Lake Michigan water?	Lori —The intent is for any or all expenses to be paid directly by the Water Utility through its rates, so there would be no impact on the property taxes.
Common Council decisions points slide—approval of supply by Great Lakes states. What is the indication that we have that it's a reasonable timeframe given all the complexity and even the lead up to getting the compact signed by the Great Lakes governors?	Dan —The goal for approval by the DNR is to have it reviewed and approved within 90 days for a permit and also a goal in the Great Lakes compact to have it reviewed and approved within 90 days. That's once they view it as complete, so we need to work with them to provide them with the information so they can do that as complete. We look at the 90 days for each of those and then some extra time in terms of providing them that information.

SUMMARY

Question	Answer
Is the first application that will be seen by the members of the compact?	Dan —This is the first application that will be seen under the Great Lakes compact. There have been other applications for Great Lakes water that have approved and also that have been denied.
We don't have a water problem, we have a political problem. The EPA could change things for us with a stroke of a pen by upping the radium allowance. Tell us why a political thrash down and delaying tactics isn't an option.	Dan —When you look at the process we need to go to implement a new water supply it would take about 5 years from when we get approval to when we start the process to implementing that process. That takes us out 5 years within that timeline. We did look at the water softeners, the issue is a lot of times the cold water that goes to your kitchen sink is not plumbed through the water softener, therefore, the radium is not removed from that stream. We would also be taking on the liability to be guaranteeing that those water softeners worked and removing the radium throughout someone's household. I don't believe the City Attorney would allow us to take on that liability. Therefore, it is not an option. Our City Attorney, the Water Utility, and the City spent a lot of time fighting the standard with regards to radium because the standard is different in different countries. Curt —An interim standard that went back longer than I've been City Attorney, the process we had been involved trying to negotiated with EPA, probably since the late 80's. Originally, the DNR did sue the City back in 1990 to comply with an interim standard—we felt it was not appropriate because the EPA had made its intentions known that it was interim and was going to change the standard and that it did not make any sense for a municipality to comply with a standard that was ultimately going to change. As it turned out, we went back in the early 90's and argued our case before the Court of Appeals procedural issue before the State Supreme Court, we were successful. Call it a delay tactic, but it was for the purposes mentioned—positive and good reasons to do so, because at the time we were looking for an expenditure to comply with the radium standard upwards of \$70 million. The operating and maintenance cost was something that may have been in addition to that, I don't think it included just the billing plan to comply. The DNR, after they lost that case, commenced another action against us in the mid-90's again to comply. They were going to change the standard—possibly a 20/20 standard for each

SUMMARY

Question	Answer
	<p>radionuclide that was in question 226 and 228. The DNR continued to proceed ahead and we were able to come to an agreement with the Attorney General's office in 1996 (Jim Doyle), not to proceed they wouldn't do any enforcement action against the City. When the action taken against the City would apply to the other municipalities and water supply systems throughout the State that exceeded the radium standard, until such time as the EPA declared its new standard. That process ultimately came about and in 2002 they went through the whole public process—adopted the regulation—we submitted information (as well as a number of other communities) most effected by radium (Illinois, Nebraska, Texas, but Waukesha was the biggest), with scientific evidence that standard of 10 or 20 supporting that was better than the proposed 5 standard that ultimately that EPA relied upon. We did challenge that along with several other groups and the EPA determination and where you challenge an EPA regulation is in the Court of Appeals in the DC in Washington DC. It was clearly an uphill battle every time you challenge an administrative rule of the federal government; the courts are not going don chemist robes or make an independent determination. They look at the standard on what basis or scientific data was relied upon by the EPA in making their determination. You might have other data that is equally acceptable, viable. We did have a number of studies—1 by UW-Wisconsin and one by an expert from Oregon laboratory, as well as a Canadian group, but the courts are not going to decide between whether the EPA's was more scientific vs. the parties challenge it, the standard is whether the EPA's standard information they relied upon, which happened to be a cancer in radium dial painters that were prevalent in the 1920's in the rate of cancer and Hiroshima, as long as what their basis for concluding with a standard is reasonable. Very difficult standard to overcome. They relied on no scientific data or was totally unreasonable. The decision came down that the EPA standard was reasonable that promulgated in 2002. It's a long process and highly unlikely that they would change it. Highly unrealistic to think they would change the standards. 2018 to comply with the radium</p>

SUMMARY

Question	Answer
	standard—I can't stress enough though, as Dan and the people here say, radium is piggy backing. The main reason again for looking for Lake Michigan and other alternatives is because of the declining aquifer not because of the radium. There could be compliance by itself, but it wouldn't make much sense if you are looking at long-term and as we continue using our existing water, as the engineers can tell you, the potential for other contaminants is getting greater and greater as they have to go deeper and deeper into the aquifer.
I want to make it perfect clear that I would not support purchasing water from anybody that wanted to make purchasing water more about than just purchasing water. If there's a supplier that wants to put things in this contract or any type of perspective contract, that don't have anything to do with water, I won't support it. I think it's important for us to understand that if we entered into an agreement with an municipality, we're buying water from you and that's it.	
We should not be buying water from any community on the Great Lakes that will have political demands or conditions for sale of their water. How many other communities are obtaining their water from the deep aquifer besides the city of Waukesha that's in that plain?	Dan —I don't know that number off the top of my head. Tony —I don't know the exact number of communities, there are several.
I understand New Berlin currently gets water from the city of Milwaukee. Has the City of Waukesha reviewed that contract to see what kind of conditions are involved with that particular contract?	Dan —We have looked at the contract. I cannot recite it off the top of my head though.
Is it purely a water contract or are there other conditions attached to New Berlin accessing Milwaukee water?	Dan —There are not all kinds of conditions attached. The only thing that was unique about that contract was that there was a one time payment that was required as a result of the contract.
I would like to know how much money we've spent as Utility and City, on indirect or direct water issues going east/west. I want to make sure we're equally looking at everything fairly.	Dan —In 2002, when we implemented the future water supply study. We looked at all the different options and what's available to us—whether it was damming up the Fox River, utilizing the quarry water, water re-use, we looked at all the options. There was nothing in that study that was pointing towards one option as the option that was our preferred option. That study said the Great Lakes and shallow aquifers were the two preferred options. SEWRPC spent 2 years studying this

SUMMARY

Question	Answer
	issue and came up with the same conclusions the future water supply study did. I don't know how much has been spent from the water utility standpoint, I know that throughout the region millions of dollars have been spent looking at water supply options. SEWRPC alone was an enormous task and burden taken on. The Great Lakes is an option for us and one we should be pursuing as an option.
How would this affect the water rates over the years?	Dan —We've done some preliminary studies, but it's really an unknown, because we are, as this common council and the Water Utility Commission, is aware, they've challenged the staff to look into federal dollars and help assist in the construction costs, so we've been working with our congress and legislator and even at the state level to try and identify federal or state dollars that would be available to help offset some of these costs. Without knowing or being able to predict how much federal or state dollars we've be able to obtain. It's hard to try and figure out what those rates are ultimately going to end up being.
The rates you are talking about would be condition upon the amount of state dollars we would receive?	Dan —As with our radium compliance, we received around \$3.5 million to offset some of radium costs. We'd anticipate federal dollars and we're even looking at the state revolving loan fund as a potential source for money to offset some of the costs that are being associated with the future water supply. It's really difficult until we know what that final supply is going to be and until we finalize the process for the federal dollars and state dollars, we won't know exactly what the impact to rates for customers are going to be, however, the one thing I can tell you, is there is going to be an impact to rates no matter what we do, because every option that we have, there's going to be a cost associated with it.
I can expect the rates are going to be astronomical because Wisconsin is almost broke; the federal government is almost broke. I'm a little concerned about that—you make it sound like we'll be able to get state and federal dollars at the snap of our fingers. That's not going to work—they don't even have money to fix bridges in Milwaukee.	Mayor —Dan and I were just in Washington DC and we met with the staff of Senator Kohl, Senator Feingold and Congressman Sensenbrenner and we did get confirmation towards the end of last year we are going to be receiving an additional \$400,000 in federal funds to help with our radium compliance which brings our total to about \$3.6 million in federal funds that we've received through this process. So we already have been successful, because if we didn't have that \$3.6 million in federal funds, our current rates would be even higher than

SUMMARY

Question	Answer
	they are. Part of our conversations is looking at other opportunities for federal funds that would help us deal with the long-term costs, so that is something we're working on and will continue to work on.
I appreciate that, I know you've worked hard doing this and your efforts are greatly appreciated, but you're talking \$5/\$6 million dollars and we're talking how many millions? \$164 million? So that \$3 or \$4 million is chicken feed at this point in time. It's helped our radium process, but I'm concerned about what's going to happen 8/9 years from now.	Dan —In relation to the radium compliance, we've received about 25 percent of the money towards that radium compliance. The other thing I will tell you is with regards to the Water Utility Commission and the way they've guided us in terms of financial planning, is that when we have bonded for money and we looked at how we're paying off that money and we have a 5 year financial plan that we project off of and as part of that 5 year financial plan we looked out to 2012 and 2013 and we looked at our bond and our payment terms for those bonds and have a decline in those years knowing that something big is coming and that's the advantage of our 5 year financial plan is that we're looking at it out in the future and when we're going to be bonding for money so we can project how we want to pay for things now so we can set ourselves up for that larger borrow in the future. The Water Utility itself would not be a bond for the total dollars we're talking about here, so we'd have to look to the City for assistance in terms of finding that money, but payback of those dollars would come from the rate payers.
What I'd like to see between now and the next meeting, is an example of what a water bill would be if we didn't receive any assistance—federal or state. You can use my house as an example of what my water bill would be now and what it would be if we didn't receive any assistance for any of the alternatives from the state or federal government.	
How large is that 2002 study?	Dan —I'm not sure of the exact size, but it is available on line at the website under the future water supply tab that's on the front page of the city's website.
Does it have an Executive Summary? I would request that a copy of the Executive Summary be put in our packets on Saturday.	Dan —Yes, it does.

SUMMARY

Question	Answer
<p>My fear is that because Lake Michigan has over the past decade actually lost water because of various factors such as the Army Corps of Engineers and the Illinois River that it's allowed water to flow at a higher rate into the Mississippi River, my concern is that there might come a time that we might be left high and dry if Lake Michigan reaches a particular water level, should we go that route. I understand that the City of Waukesha wants to be a model city in the Great lakes water usage—my concern is that if we're allowed, how many other municipalities will want to follow suite and how does that impact the drawdown on the water from Lake Michigan.</p>	
<p>Also, as was mentioned, what happens if the Lake Michigan water level drops?</p>	
<p>Where does the EIS fit into that?</p>	
<p>Do you have to pay back grant funding?</p>	
<p>I applaud the Utility for its detailed studies that they've done on the water supply issue and I believe they're pursuing the best long-term solution. One question that I have—is the debt that has to be taken down for these future capital projects, is that proposed be paid back by the general city tax or is that going to be part of the rate structure of the Utility, because those two are separate items.</p>	
<p>If this is possible to remove this, this money that's going to be handed down to us from federal or county, could that be applied to removing the radium?</p>	
<p>I want it to go on the record from you that indeed, if this application is approved; the shallow aquifer wells would only be a back-up well and wouldn't be used on a routine basis.</p>	
<p>What is the plan for moving forward from here with the application?</p>	
<p>We have a March 8th public comment meeting scheduled and then what's happening after that? When will this be brought forward to the Common Council for a vote and what steps will you take to incorporate public comment into either a vision or a new plan after the public comment period is over?</p>	

SUMMARY

Question	Answer
I asked that question last week and you said your answer that your water softeners at home—they do not filter it, but there are filters and we have filters working right now that filter the radium out. Why can't we do that?	
How would utilizing quarry water affect septic and well systems for people in that area and what do you think the DNR's response might be to doing this?	
Do we even know that the owners of the quarry are willing to sell?	
Do you have any idea how much the City might be fined per day if we are not in compliance with the mandate set by the DNR?	
How much have we already paid in fines if we have paid any?	
Lastly, there have been a number of articles lately written by people fearing that if we get water through Milwaukee that we would be at their mercy and lose our sovereignty.	
Do you know exactly what Milwaukee will charge per gallon per water? 2. Do you know exactly how many millions of dollars we'll have to pay Milwaukee in economic compensation? 3. Do you know the exact amount of federal grant money we might receive? 4. Do you know the exact price of the pipeline? 5. Do you know that over time having to go through periodic renegotiations with Milwaukee that Waukesha will really end up saving money?	

Attachment WS7
Unconfined Deep Aquifer
Water Supply Evaluation

Unconfined Deep Aquifer Water Supply Evaluation

TO: Waukesha Water Utility

FROM: CH2M HILL

DATE: March 11, 2011

This memorandum responds to question WS7 from the Wisconsin DNR's letter of December 2, 2010, on the City of Waukesha's Application for Lake Michigan Water Supply.

Comment WS7

Additional information is required to determine whether the unconfined deep aquifer is a viable technical water supply alternative for the City of Waukesha. The 2002 Future Water Supply Study states that the unconfined deep sandstone aquifer is a sustainable and adequate water supply. The 2002 Study also indicates that the unconfined aquifer is a cost-effective option. Further, the 2002 Study states that two area municipal systems, Oconomowoc and Dousman, have wells that maintain static water levels in the unconfined sandstone aquifer with well depths within 100 ft of ground surface. The 2002 Future Water Supply study states "the aquifer is thinner in this area, generally less than 1,000 feet, but the capacity in the wells is relatively high, generally over 1,000 gpm, due to the ample recharge and high permeability of the sandstone". The 2002 study also states that "water levels are not declining significantly in this area in spite of a large drawdown in the confined portion of the aquifer." Primary rejection of the unconfined deep water aquifer to the west as an alternative (as stated in the Water Supply Service Area Plan) relates to the alleged potential for legal challenges that would expose the City of Waukesha to potential damage claims from lake area homeowners and municipalities.

Updated cost information must be provided for this alternative. Also, provide additional information describing what the sustainable water yields from the unconfined deep aquifer would be as a potential water source for the City of Waukesha. What type of well network could be established? Provide information describing sustainable pumping rates from each well.

Response to Comment WS7

RJN Environmental Services modeled the unconfined deep sandstone aquifer under various pumping conditions. Attachment WS7A (RJN Environmental Services, LLC, February 2011, Summary of Groundwater Modeling) contains the modeling results. The results were used to evaluate this water supply source as the primary source for the City of Waukesha and also as a partial source in a multi-source water supply alternative (see WS10 response).

The following analysis used the aquifer as the primary water supply source for the City of Waukesha. It was evaluated consistently with the other water supply alternatives in the Application for Lake Michigan Supply based on four criteria:

- **Environmental Impacts**
 - Impact on ground and surface waters of the Great Lakes Basin
 - Impact on ecosystem flora and fauna environmental sustainability

- Greenhouse gas emissions
- **Long-Term Sustainability**
 - Reliability during droughts and infrastructure failures
 - Ability to provide adequate supplies of potable water to the public for generations without adverse environmental impacts
- **Public Health**
 - Quality of the water for human consumption to protect public health
 - Potential for contamination
- **Implementability**
 - Infrastructure requirements
 - Operation and maintenance requirements
 - Land requirements, legal issues, easements, public impact

Each of these four criteria are further defined in Exhibit 1. The environmental impact descriptions are consistent with the Application's Environmental Report.

Unconfined Deep Aquifer

In this alternative, 10.9 mgd would be pumped on an annual average from the unconfined deep aquifer about 12 miles west of Waukesha. The maximum day capacity would be 18.5 mgd with the largest well out of service. Assuming a well capacity of 1.5 mgd each,¹ 13 wells would be required for firm capacity. The wellfield was assumed to have a minimum spacing of roughly one-half mile between wells.² The water would be pumped through a pipeline, treated to remove iron and manganese, then distributed throughout the City of Waukesha water distribution system. The major facilities are shown in Exhibit 2.

Environmental Impacts

A recent USGS report³ indicated that water availability limitations may arise in the western Lake Michigan basin. Pumping the deep aquifer near Waukesha was specifically mentioned, resulting in large groundwater level drawdowns, and capturing water that would have otherwise have naturally discharged to Lake Michigan. This diversion of flow away from Lake Michigan is a central environmental issue in the groundwater alternatives in the Application.

Pumping from the unconfined deep aquifer was modeled using the SEWRPC regional groundwater model at flows between 2 mgd and 15 mgd.⁴ Modeling results indicated drawdowns in the sandstone aquifer between 46 feet (2 mgd) to 240 ft (15 mgd) near the wells. This corresponded to drawdowns in the shallow aquifer (above the sandstone) of 0.28 foot (2 mgd) to 1.6 feet (15 mgd). Groundwater drawdown contours in the shallow aquifer at 10 mgd are shown in Exhibit 3.

¹ Future Water Supply, CH2M HILL 2002.

² Ibid.

³ Reeves, H.W., 2010, Water Availability and Use Pilot—A multiscale assessment in the U.S. Great Lakes Basin: U.S. Geological Survey Professional Paper 1778

⁴ RJN Environmental Services, LLC. February, 2011. Summary of Groundwater Modeling . Reviewed by Dr. Kenneth R. Bradbury – Wisconsin Geological and Natural History Survey.

EXHIBIT 1
Water Supply Evaluation Criteria

	No Adverse Impact	Minor Adverse Impact	Moderate Adverse Impact	Significant Adverse Impact
Environmental^a				
Impact on groundwater resources	Causes rebound of the deep aquifer in City of Waukesha and no drawdown of the shallow aquifer or temporary impacts from construction. Does not reduce stream flow at any time.	Stabilizes draw down of the deep aquifer in City of Waukesha and shallow aquifer draw down of 5 feet or less affects fewer than 5 acres of wetlands or unconfined deep aquifer drawdown causes shallow aquifer drawdown of 1 foot or greater that affects fewer than 5 acres of wetlands.	Draw down of the deep aquifer continues and shallow aquifer draw down of 5 feet or more affects greater than 5 but less than 10 acres of wetlands or unconfined deep aquifer drawdown causes shallow aquifer drawdown of 1 foot or greater that affects greater than 5 but fewer than 10 acres of wetlands.	Draw down of the deep aquifer continues or shallow aquifer draw down of 5 feet or more affects greater than 10 acres of wetlands or unconfined deep aquifer drawdown causes shallow aquifer drawdown of 1 foot or greater that affects greater than 10 acres of wetlands.
Aquatic habitat loss	Temporary impacts from construction; ² neutral or improved habitat creation and frequency of availability from operation.	Reduced baseflow in a segment of warm water streams of up to 25%, causing habitat loss. Substrate change to Lake Michigan ³ of fewer than 10 acres.	Reduced baseflow in a segment of warm water streams of greater than 25% but less than 50%, causing habitat loss. Reduced baseflow in a segment of cold water streams, but less than 25%. Substrate change to Lake Michigan of greater than 10 but less than 20 acres.	Reduced baseflow in a segment of cold water streams of 25% or more or reduced baseflow in a segment of warm water streams of 50% or more, causing habitat loss. Substrate change to Lake Michigan of greater than 20 acres.
Operational impact to wetlands ^d	No temporary or operational impacts to existing wetlands greater than 0.1 acre.	Temporary construction impacts to wetlands. Operational impacts of greater than 0.1 acre but less than 5 acres of existing wetlands.	Operational impacts of greater than 5 but less than 10 acres of existing wetlands.	Operational impacts of more than 10 acres of existing wetlands.
Vegetation and Wildlife Resources	No long-term, operational impacts.	Operational impacts occur from new above ground structures to areas without special wildlife area protection. Groundwater drawdown to areas with special wildlife protection areas or wetlands impact is	Groundwater drawdown to areas with special wildlife protection areas or wetlands impact is greater than 5 but less than 10 acres.	Groundwater drawdown to areas with special wildlife protection areas or wetlands impact is greater than 10 acres.

EXHIBIT 1
Water Supply Evaluation Criteria

	No Adverse Impact	Minor Adverse Impact	Moderate Adverse Impact	Significant Adverse Impact
		less than 5 acres.		
Long-Term Sustainability				
Percent of water returned to the original water source from where it was extracted	100%	75% to 99%	50% to 74%	<50%
Water supply impact by drought	Very large surface water or confined deep aquifer	Large surface water or unconfined deep aquifer	Medium surface water or confined shallow aquifer	Small surface water or unconfined shallow aquifer
Groundwater Drawdown	0	1 to 50 ft	51 to 149 ft	>150 ft
Public Health				
Potential contaminant source locations contained within the 1 ft groundwater drawdown contour line or within 1 mile from the water supply source	1 to 2	3 to 5	6 to 10	>10
Treatment required to meet primary drinking water standards or wastewater regulations	No treatment	Conventional surface water or groundwater treatment	Conventional surface water or groundwater treatment plus treatment to remove one additional contaminant	Conventional surface water or groundwater treatment plus treatment to remove two or more additional contaminants, or potential for increased wastewater treatment or sludge disposal requirements.
Blending different water sources for a consistent water quality	1 water source	2 water sources	3 water sources	>3 water sources

EXHIBIT 1
Water Supply Evaluation Criteria

	No Adverse Impact	Minor Adverse Impact	Moderate Adverse Impact	Significant Adverse Impact
Implementability				
Facilities to Operate and Maintain (wells, treatment plants, pump stations)	1 to 3	4 to 10	11 to 20	>20
Number of land sites required	1 to 3	4 to 10	11 to 20	>20
Potential number of municipalities, counties and utility companies to coordinate with	1 to 2	3 to 5	6 to 9	>9
Potential number of wells adversely affected by the water supply	0	<100 private wells within the 1 foot groundwater drawdown contour and no public drinking water or high capacity wells within the 10 foot groundwater drawdown contour	100 to 500 private wells within the 1 foot groundwater drawdown contour line or <5 public drinking water or high capacity well within the 10 foot groundwater drawdown contour	>500 private wells within the 1 foot groundwater drawdown contour line or >5 public drinking water or high capacity well within the 10 foot groundwater drawdown contour

Note: Adverse impacts in the Environmental category are consistent with the Environmental Report with adjustments made to account for the additional water sources. Adverse impacts for the Long Term Sustainability category are similar to the environmental impacts, but associated with the long-term dependability of the source water. Adverse impacts under the Public Health category reflect relative potential drinking water supply risks and reliability of the source water quality. Adverse impacts for the Implementability category reflect the relative number of local jurisdictional obstacles to obtaining the source water.

^aSee Appendix N, Environmental Report, for details and definitions.

^bA temporary construction impact example is a buried pipeline where the surface above the pipe is restored after construction.

^cA substrate change to Lake Michigan would be disturbing the lake bottom, such as during installation of a return flow pipe.

^dAn operational impact example is groundwater drawdown affecting wetlands or a permanent aboveground structure such as a pump station that affects wetlands.

The shallow aquifer is above the sandstone, and these drawdowns indicate impacts on surface water sources such as rivers, streams, and lakes. Exhibit 4 shows groundwater drawdown contours in the unconfined deep sandstone aquifer at 10 mgd. It is estimated that 10 mgd of groundwater pumping will impact 480 acres of wetlands and over 100 acres of surface waters within the 1 foot drawdown contour line. Note that the drawdown indicates pumping at average day demands during normal recharge conditions. At maximum day demands the drawdown would be much greater.

Water extracted from the unconfined deep aquifer intercepts natural recharge of the deep confined sandstone aquifer near Waukesha. Removing this water will not eliminate adverse environmental impacts from drawdown in the deep confined aquifer (see Alternative 1 in the Application for Lake Michigan Water Supply) and still adversely affects the amount of groundwater recharging the Lake Michigan basin.¹

A portion of the water pumped from the unconfined deep aquifer is induced from surface waters. This water is transferred from the Rock River watershed to the Fox River watershed when discharged from the Waukesha wastewater treatment plant. Transferring water from the Rock River system by pumping municipal wells for the City of Waukesha water supply and sending the water to the Fox River basin could raise concerns about diminished flow in the Rock River system. A similar Wisconsin inter-basin transfer example where concerns were raised is the Upper Sugar River system near the City of Verona, Wisconsin. When water was to be transferred out of the system for wastewater treatment, a return line discharging water to Badger Mill Creek in the Upper Sugar River Watershed was installed to maintain base flows in that system. Our cost estimate assumes a return line to the Rock River watershed would not be required.

The groundwater drawdown affects a large land area, with many wetlands, lakes and streams. Water extracted from the ground reduces the water that would naturally flow to wetlands, lakes and streams (base flow). The model estimated that base flow in some surface waters near the wells would be reduced as shown in the table below with this alternative, pumping at the average day flow of 10 mgd.² The impact would be much greater at maximum day demand pumping. There are adverse environmental impacts from pumping the entire Waukesha water demand from this aquifer, especially during maximum day demands.

Water transmission pipelines in the unconfined deep aquifer wellfield and extending to Waukesha would have environmental impacts during construction.

Home water softening would continue because unconfined deep aquifer groundwater is much harder than Lake Michigan water. The adverse environmental impacts associated with home water softening (salt discharge to surface waters, additional water and energy use) would remain.

It is estimated that this alternative would discharge more than 24,000 tons of greenhouse gases per year (carbon dioxide equivalent). Greenhouse gases would be produced by pumping from the unconfined deep aquifer, treating the water and pumping the water to Waukesha. This alternative produces about 60 percent more greenhouse gases than the Lake

¹ Ibid.

² Ibid.

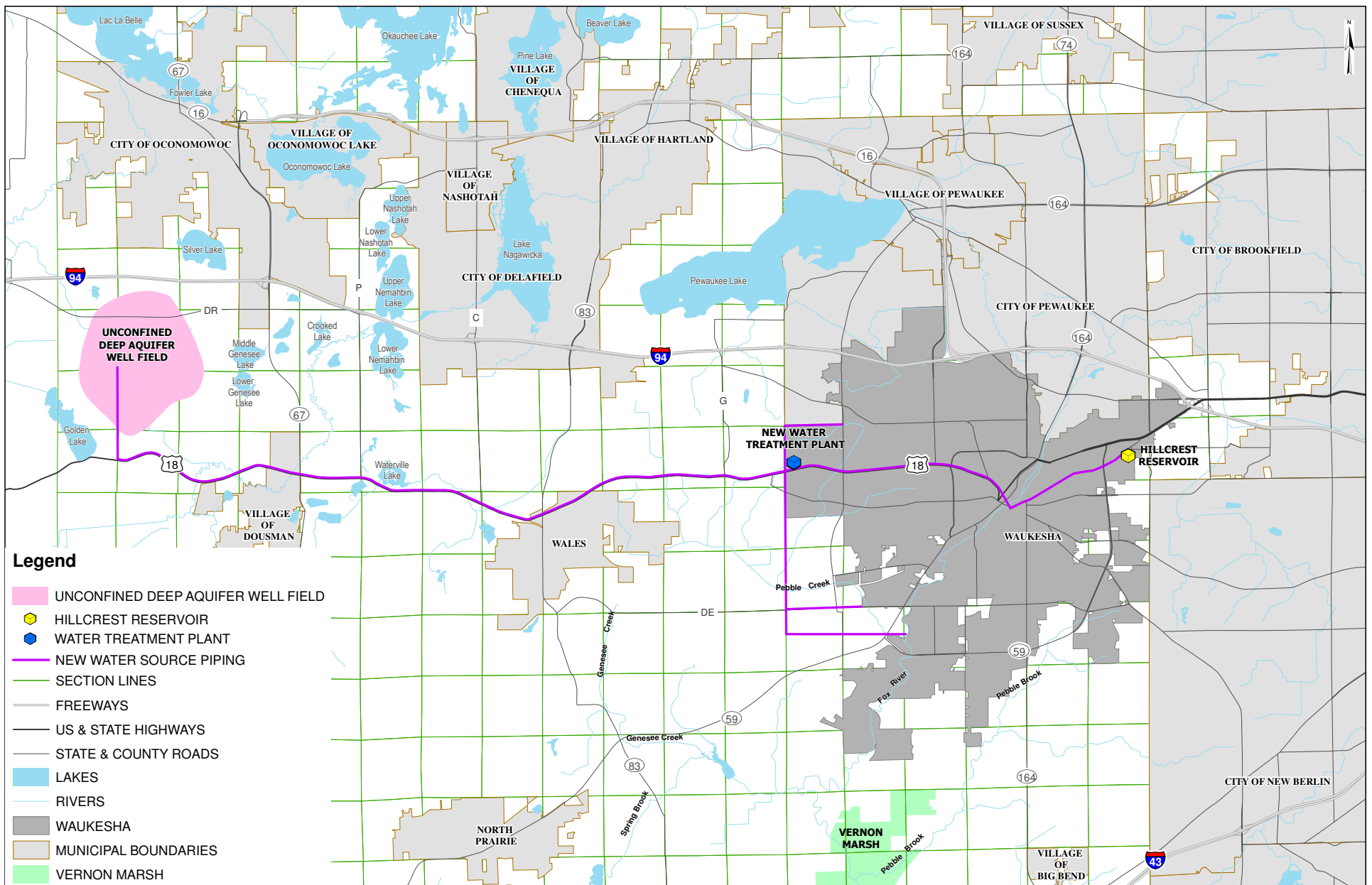


EXHIBIT 2
Unconfined Deep Aquifer Facilities

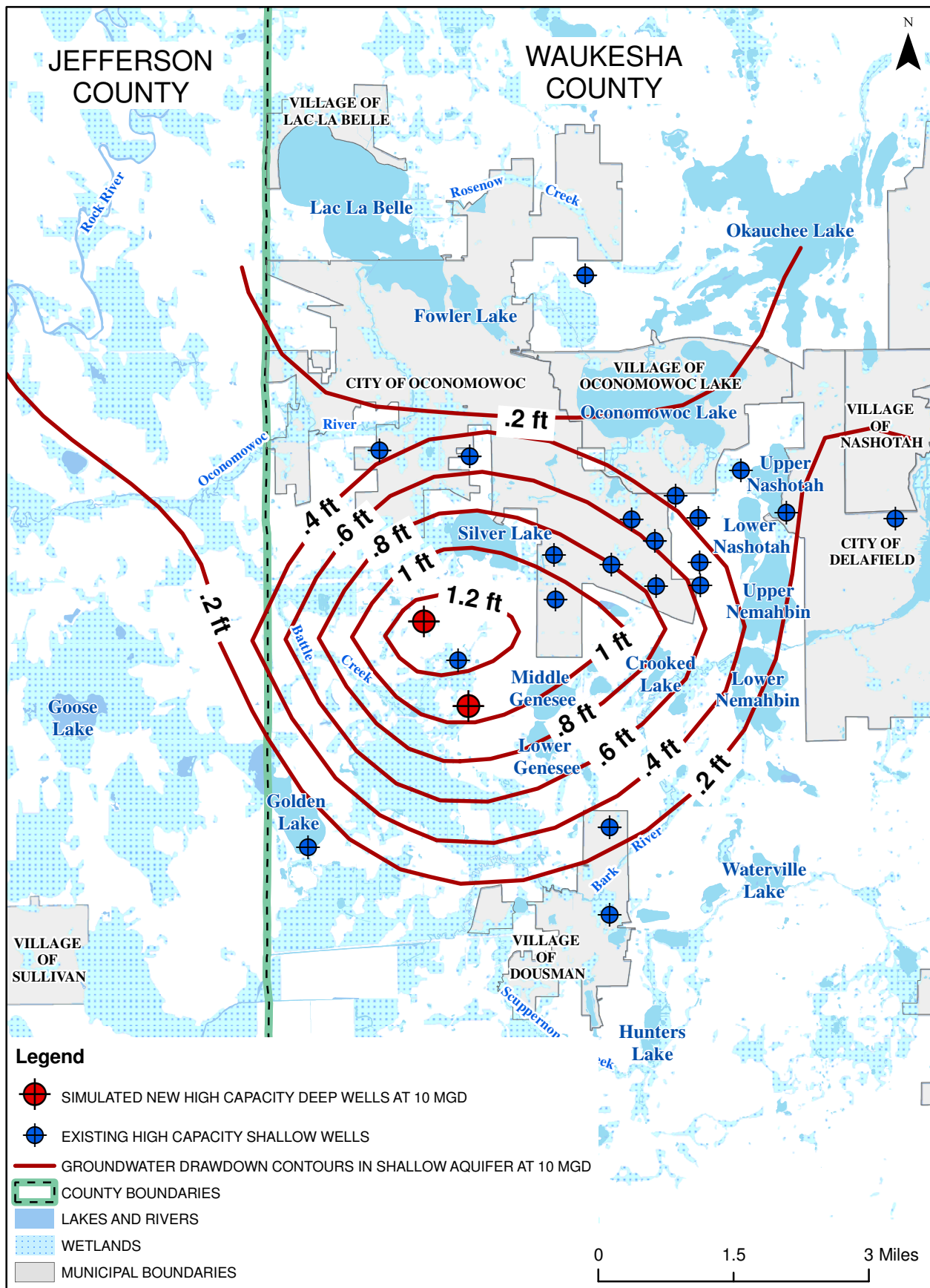


EXHIBIT 3
Shallow Aquifer Groundwater Contours at 10 mgd

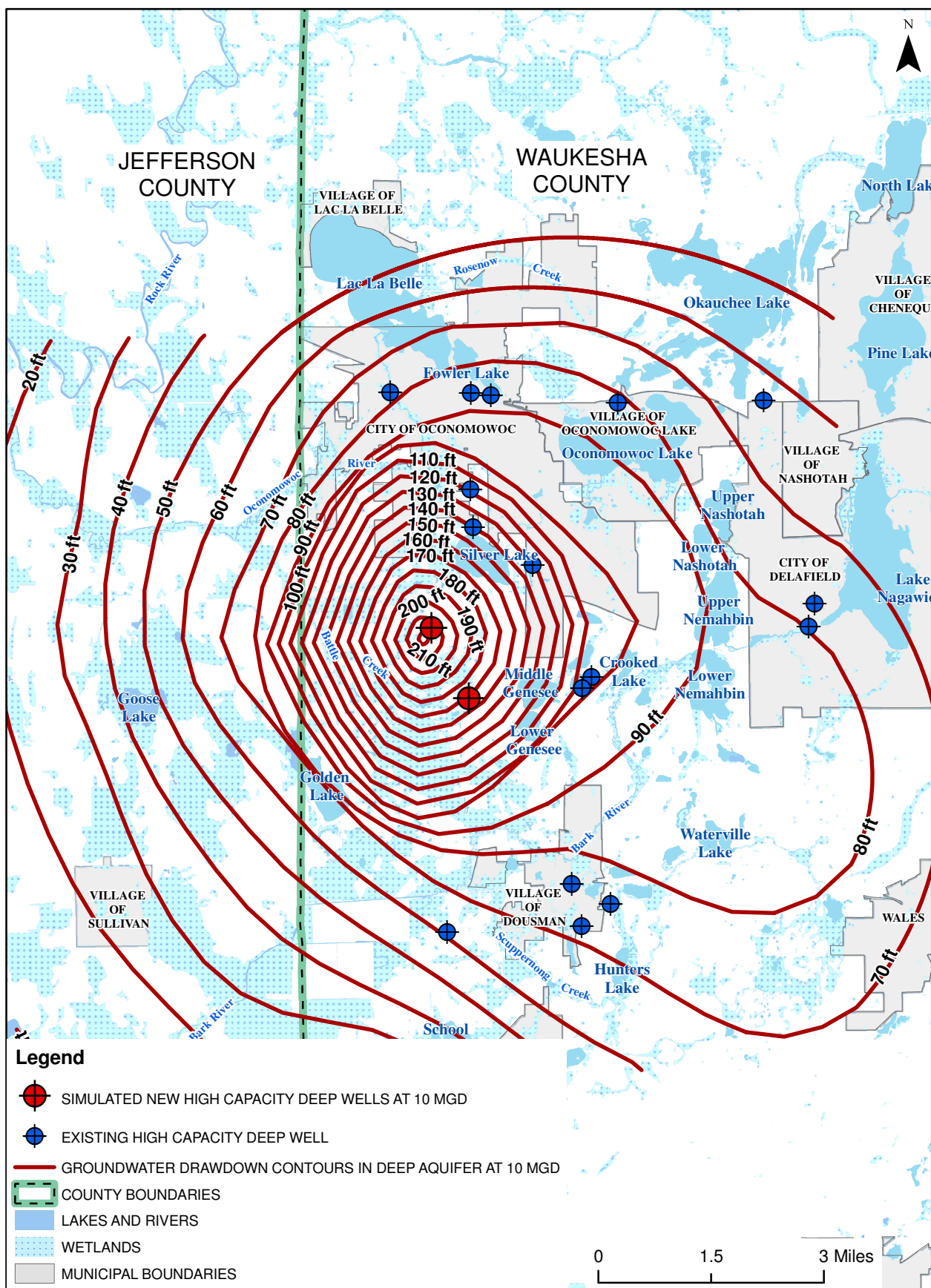


EXHIBIT 4
Deep Aquifer Groundwater Contours at 10 mgd

Michigan Alternative. A comparison of greenhouse gas emissions from all water supply alternatives is in attachment WS10.

Considering the environmental impacts of Alternative 3, a rating of “significant adverse impact” was applied. Use of the unconfined deep aquifer has greater adverse environmental impacts than the proposed Lake Michigan supply.

Resource	Baseflow Reduction (%) from Pumping 10 mgd	Baseflow Reduction (%) from Pumping 15 mgd
Bark River	44	48
Silver Lake	21	24
Genesee lakes	20	26
Duck Lakes	19	25
Battle Creek and Laura Lake	12	15

Long-Term Sustainability

None of the water extracted from the unconfined deep aquifer would be returned to its source. The water would be taken from the Rock River watershed, transferred to the Fox River and ultimately to the ocean.

The unconfined deep aquifer is less susceptible to drought than shallow aquifers, but will still be impacted by limited recharge. The unconfined deep aquifer is in the recharge zone for that aquifer, making it more reliable from a production standpoint than the deep confined aquifer or shallow aquifers.

Pumping from the unconfined deep aquifer at rates required for Waukesha has significant adverse environmental impacts as discussed above. Groundwater modeling indicates that the sandstone aquifer drawdown is much greater than 150 feet, an amount high enough to designate a groundwater management area, according to Wisconsin Act 310. See Legal Exhibit D for additional information on Wisconsin Act 310 and groundwater management areas. Note that modeled groundwater drawdown extends into Jefferson and Waukesha counties. The drawdown indicated is additional drawdown from current groundwater levels. Groundwater in the unconfined deep aquifer is already about 100 feet below predevelopment groundwater levels in some areas near Oconomowoc (see Exhibit 3-4 in the Application for Lake Michigan Water Supply), so actual drawdown from predevelopment is much greater than shown in Exhibit 4. In addition, the area of groundwater drawdown influence is large and extends into Jefferson County. At a 15 mgd pumping rate, groundwater drawdown greater than 120 feet occurs in Jefferson County, and drawdown greater than 120 feet extends about 6 miles to the southeast.³

This large groundwater drawdown can adversely affect long-term sustainability if pumping rates must be decreased to reduce drawdown or impacts on baseflow and surface water resources. The wellfield area is far outside the City of Waukesha boundaries, and other private and municipal wells will be affected. Many lakes and surface water bodies will also be affected. These issues jeopardize long-term sustainability and reliability because wellfield production could be ordered by WDNR to be reduced or stopped.

Considering the long-term sustainability of Alternative 3, a rating of “significant adverse impact” was applied.

³ Ibid.

Public Health

The unconfined deep aquifer can produce good quality water. There are wells in this area with radium concentrations below the state drinking water standards and do not exceed any primary drinking water regulations. Treatment requirements would likely include conventional groundwater treatment with iron and manganese removal and disinfection. Home softening would still be practiced, so the increased sodium and total dissolved solids would still be present in home drinking water.

Like all aquifers, the unconfined deep aquifer is susceptible to contamination, but to a lesser degree than the shallow aquifer because surface contamination would have to travel farther. The groundwater drawdown area has 3 potential sources of contamination in this area. Preventing contamination will be more difficult because the wellfield is outside the City limits, and, as a result, the City will not have zoning authority to enforce a wellhead protection ordinance to protect the wells.

Water would come from a single source, so there would be no need to blend waters for a consistent quality.

Considering the public health impacts of Alternative 3, a rating of “minor adverse impact” was applied.

Implementability

This alternative would require the siting and construction of at least 13 wells, interconnecting piping, a pump station, a long transmission pipe to Waukesha, and a treatment plant for removal of iron and manganese and disinfection. Waukesha would have to operate and maintain a remote wellfield and pump station. In addition, a large water treatment plant would have to be operated and maintained.

Each well, pump station and treatment plant would likely require land acquisition. Approximately 10 municipalities/counties/utility companies are anticipated to require coordination to construct the water supply facilities. Land purchase and easement requirements for the unconfined deep aquifer supply may be more difficult to implement than those of the shallow aquifer near Waukesha because of the greater distance from Waukesha.

Pumping water from this aquifer would create a large area of groundwater drawdown. Over 150 private wells are within the one foot groundwater drawdown contour line area, and over 10 high capacity or public drinking water wells are within the 10 foot groundwater drawdown contour line area.

Installing high capacity wells in the unconfined aquifer west of the Maquoketa shale presents not only logistical but also definite legal problems. Installation of high capacity wells in an unconfined aquifer could result in legal challenges and expose the City to numerous damage claims from lake area homeowners, residents and businesses on private wells and municipalities. See Legal Exhibit A for additional information on the legal issues.

Considering the implementability of Alternative 3, a rating of “significant adverse impact” was applied.

Summary

Exhibit 5 summarizes the criteria for the unconfined deep aquifer. Attachment WS10 contains a comparison of all water supply alternatives to these criteria.

Capital costs for this alternative are estimated at \$228 million and annual operation and maintenance costs at \$6.6 million. Additional cost information is in Attachment WS Cost.

EXHIBIT 5
Evaluation Criteria for Unconfined Deep Aquifer

Major Criteria	Subcriteria	Rating	Overall
Environmental	Impact on Groundwater Resources	●	●
	Aquatic Habitat Loss	⊙	
	Operational Impacts to Wetlands	●	
	Impacts to Vegetation and Wildlife	●	
Long-Term Sustainability	Water Returned to Original Source	●	●
	Supply Impacted by Drought	⊙	
	Groundwater Drawdown	●	
Public Health	Nearby Contaminated Sources	⊙	⊙
	Treatment Requirements	⊙	
	Ability to produce Consistent Water Quality	○	
Implementability	Operation and Maintenance Complexity	⊙	●
	Land Sites Required	⊙	
	Municipal/County/Utility Coordination Required	●	
	Wells Impacted	●	

○ No adverse impact ⊙ Moderate adverse impact
 ⊙ Minor adverse impact ● Significant adverse impact

Attachment WS7A
Groundwater Modeling Summary Report



SUMMARY OF GROUNDWATER MODELING

February 2011

Groundwater modeling was completed to evaluate the potential for resource development by the Waukesha Water Utility in the unconfined sandstone aquifer of western Waukesha County. This area was studied pursuant to recommendations for future demands in the Waukesha Water Utilities 2002 water supply study. The model utilized was the MODFLOW simulation of the Southeastern Wisconsin Regional Planning Commission (SEWRPC) counties (the SEWRPC model), constructed and calibrated by the United States Geological Survey (USGS).

The same model was utilized to evaluate the aquifer recovery if pumping of the existing Waukesha Water Utility sandstone wells was reduced or discontinued. For this work, the simulated flow of groundwater across the sub-continental divide was observed with respect to its flow to the east or west, with easterly flow representing improvements in aquifer conditions.

Modeling was also completed of the shallow wells adjacent to the Fox River, north of Vernon Marsh. This was completed as a supplement to the modeling of that area completed in the spring of 2010. For this work, the SEWRPC Troy Bedrock Valley model (the Troy Bedrock Valley model) was used. As with the larger SEWRPC model, MODFLOW was also used for this model.

USGS SEWRPC MODEL DESCRIPTION

In addition to the seven SEWRPC counties, the SEWRPC model includes significant far-field areas in all directions, which provide a buffer area between the SEWRPC counties and the model boundaries. The model's cell dimensions in the near-field area (i.e., the SEWRPC counties) are 2,500 feet on a side.

WESTERN UNCONFINED SANDSTONE AQUIFER SIMULATIONS

Figure 1 shows the approximate area of the recommended wellfield expansion, as well as existing wells that are simulated in the model in the vicinity of the potential expansion area. As the figure shows, numerous lakes, streams and wetlands are present in this area. These features were simulated in a variety of ways. Wetlands were simulated using MODFLOW's drain module. This module allows surface water to be released to the aquifer, but does not allow the aquifer to release water to the drain cells. Lakes and streams were simulated using MODFLOW's stream and river modules. River modules exchange water to and from the aquifer. The surface water feature is defined by a pre-determined stage, as well as a conductance value. Stream cells are somewhat similar to river cells; however, additional input

is required, which allow the model to estimate flows as well as the exchange of water to and from the aquifer.

Whether simulating drain, river or stream features, the model's solver is based on the assumption that the surface water feature covers the entire model cell, when in reality it typically only occupies a small portion of it. This condition is accounted for in the estimation of the conductance term, which restricts the amount of vertical flow through the cell. However, in consultation with Daniel Feinstein of the USGS and Dr. Ken Bradbury of the Wisconsin Geological and Natural History Survey, it was determined that no wells should be simulated within a cell that also contains a drain, river or stream.

Figure 2 shows the model grid in the area of the potential expansion. Any cell that is not white contains a surface water feature. As the figure shows, this leaves only two cells that are completely within the area that do not have surface water features. Consequently, the initial runs simulated wells in these two cells, as shown on Figure 2. In runs at higher pumping rates a third well was added outside the area, also shown on Figure 2, in an effort to spread the impacts.

In comparing simulated wells with geologic logs, it was determined that sandstone wells in this area were simulated in model layers 11 through 16; consequently, this convention was followed in the current modeling, as well.

As Figure 1 shows, numerous existing high capacity wells are present in the vicinity of the proposed expansion. Table 1 summarizes the wells that are plotted on the figure. These wells are included in the model runs, simulated at a pumping rate equal to their individual WDNR-approved average daily rates.

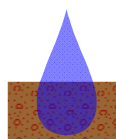
The following model simulations were completed:

- Base conditions (no new wells)
- Two wells pumping a total of 2 million gallons per day (MGD)
- Two wells pumping a total of 10 MGD
- Three wells pumping a total of 10 MGD

Because the concern with the potential new wells is from long-term pumping, all simulations were steady state. The third well was added because anything beyond 10 MGD caused the aquifer to dry up in the area of the new wells.

Table 2 summarizes the maximum simulated aquifer drawdowns caused by the pumping scenarios. Because the sandstone in this area is unconfined, summaries are provided for layers 1 and 11. Plots of the cones of depression for layers 1 and 11 are presented on Figures 3 through 8.

Simulated drawdowns in layer 1 were very low, ranging from less than 1/2 foot to less than 2 feet; however, this is likely deceptive because of the many surface water features providing a supply to the shallow groundwater. The simulated drawdowns in layer 11 are likely more



reliable, ranging from 46 feet to 240 feet. The addition of a third well provided some relief; however, the drawdown was still large.

Figures 3 and 4 show the simulated cones of depression for layers 1 and 11, respectively, with two wells each pumping at a rate of 1 MGD. A pattern is present in these two figures that remains through all simulations. The cone of depression is centered on the northernmost new well, and the cone is elongated west to east, mainly in the eastern direction. The cone being centered on the northern well is likely due to the fact that the cell that it is simulated in is not surrounded on all sides by surface waters. The two cells directly to the east of that well have no surface water features, and therefore no source of recharge.

This is also a cause for the elongation of the cone of depression; however, two other conditions likely contribute. First, numerous additional wells are located to the north-northeast, adding to the stress in that area. Second, confined conditions are present to the east, which is likely causing the cone to be drawn in that direction.

Figures 5 and 6 show the results of the first 10 MGD run, in this case with two wells. A new trend appears in layer 1 (Figure 5), with the drawdown being pulled to the northwest and northeast. Based on a review of the model to the northwest, there are two inactive cells to the northeast for the uppermost eight layers, where the Rock River intersects the sandstone aquifer. It is likely that this is the cause of the drawdown being pulled in that direction. With respect to the northeast, the drawdown is being pulled through an isthmus between several lakes, likely causing that effect. As Figure 6 shows, a drawdown of over 100 feet is now extending into Jefferson County.

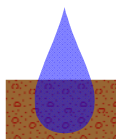
The addition of a third well improves conditions, especially in layer 11 (Figure 8). The third well draws the cone of depression a bit further to the southeast; however, the drawdown in Jefferson County is now less than 100 feet.

Table 3 summarizes the results of simulated reductions in base flows to the stream segments labeled on Figure 1. Although the table shows that less than 50 percent of the total pumping rate comes from the base flow of these streams, it should be noted that 100 percent of the pumping volume will be attributed to a loss of base flow and recharge, because the simulated aquifer is unconfined. Not presented in this table are the drains (wetlands) and the surface waters simulated by the river module.

WAUKESHA WATER UTILITY SANDSTONE WELL SIMULATIONS

Simulated flow rates of the existing Waukesha Water Utility's sandstone wells were reduced to observe the potential recovery of the confined sandstone aquifer potentiometric surface at lower pumping rates. Figure 9 shows the simulated potentiometric surface with the wells pumping at the average daily approved rates, which are summarized in Table 4. Vectors on the figure show groundwater flow directions.

Lake Michigan is a very strong groundwater discharge force. Modeling has shown that pre-development groundwater flow was easterly, toward the lake. However, Figure 9 shows a



contour of 400 feet being pulled back to the west of the sub-continent divide, and groundwater flow in this area being diverted, and in some locations reversed.

Figure 10 shows the change in flow when the Waukesha sandstone wells are reduced to 1/4 their approved capacity. Although this results in an approximate 50-foot recovery of the potentiometric surface, some diversion and reversal in groundwater flow is still present.

Finally, a model simulation was conducted with all existing Waukesha Water Utility sandstone wells shut off. The results of this model run are shown on Figure 11. Even with these wells out of service, some diversion occurs, because numerous other high capacity wells are still in operation.

TROY BEDROCK VALLEY MODEL DESCRIPTION

The model itself covers a large portion of Waukesha and Walworth Counties. The area of concern is the northern portion of Vernon Marsh, including reaches of the Fox River, Pebble Brook and Mill Brook, all located in the central area of the model. Consequently, simulated impacts of wells are not influenced by model boundary conditions. Surface waters of the model are simulated as rivers, and wetlands are simulated as drains. In the river option, surface waters can receive groundwater from the aquifer, or lose water to the aquifer. Drains can only receive water from the aquifer.

As with the model discussed above, this model simulates steady-state conditions. That is, the model assumes that simulated wells are operating all the time, with the simulated flow rate being spread over a 24-hour period.

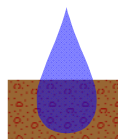
MODEL RUN AND RESULTS

Existing Waukesha wells 11, 12 and 13 were simulated, as well as five possible wells in the Fox River alluvial deposits, located immediately north of the Vernon Marsh. The model as developed for SEWRPC had wells 11, 12 and 13 placed in layers 4 and 5, so that convention was followed with the alluvial wells.

Wells 11, 12 and 13 were simulated at a combined rate of 1.2 MGD, with the flow being distributed evenly between the three wells. The alluvial wells were simulated at a combined rate of 1.5 MGD, also with the flow distributed evenly.

Figure 12 shows the well locations and the simulated drawdown. Being shallow wells, the shape of the cone of depression was heavily influenced by surface waters, including the Fox River and the Vernon Marsh.

Table 5 summarizes the simulated changes in base flow to the Fox River, Vernon Marsh, Mill Creek and Pebble Creek. For the area observed, the model indicates that the simulated pumping rate will result in a 94 percent reduction in base flow to the Fox River. Although



Pebble Creek experiences less reduction, the simulated reduction of 19 percent is still significant.

DISCUSSION

WESTERN UNCONFINED SANDSTONE AQUIFER

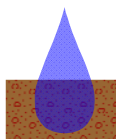
Although the percent of pumping derived from the stream segments summarized in Table 3 reduce from nearly 50 percent at 2 MGD to 14 percent at 15 MGD (with three wells), two conditions should be noted. First, the cone of depression, and therefore the reduction in base flow, extends farther beyond the area summarized as pumping rates increase, thereby drawing more water from other areas. Second, even though the percentage of total pumping decreases in these stream segments with an increase in pumping rates, a review of the individual columns shows that the percent reduction in base flow in the individual stream segments increases significantly as the total pumping rate increases.

Although the pumping simulated in the unconfined sandstone aquifer of western Waukesha County is not directly causing a drawdown in the deep aquifer to the east, the result will be to adversely impact the ability of the confined aquifer to recover. Because the recharge for the unconfined aquifer is in the area of the simulated pumping, and in Jefferson County to the west, the withdrawal of groundwater in the proposed area of expansion will intercept recharge that would otherwise flow to the confined aquifer, providing the recovery that is sought in Groundwater Management Areas (GMAs). This is illustrated on Figure 13, which is the potentiometric surface that results when all existing Waukesha Water Utility wells are shut off, and three wells in the western unconfined aquifer are pumping at a combined rate of 10 mgd. A comparison of Figures 10 and 13 shows that the impacts in the vicinity of the sub-continent divide are virtually identical to the situation where the existing wells are pumping at 1/4 their approved rate.

Finally, although a drawdown of greater than 150 feet below the pre-development water levels is not prohibited by statute, this condition results in the creation of a GMA. The purpose of establishing GMAs is to identify areas in which aquifers have been severely impacted, and the local governments are directed to take action to conserve and alter the use of groundwater to allow the impacted aquifer(s) to recover. The pumping simulated in this study would not only serve to defeat that purpose, but extend the impacts farther to the west.

EXISTING SANDSTONE WELLS

Reducing or eliminating the existing sandstone wells from service clearly has a positive effect on the confined aquifer, provided that the pumping is not simply relocated to another point in the same aquifer, regardless of whether it is confined or unconfined. The modeling indicates that the aquifer's potentiometric surface can rebound by at least 50 feet by reducing the pumping by three fourths, and by approximately 150 feet if the wells are removed from service.



However, because significant pumping continues from neighboring communities, the potentiometric surface would remain some 300 feet below pre-development levels.

SHALLOW WELL FIELD

Modeling indicates that wells 11, 12 and 13, in combination with Fox River alluvial wells, will significantly reduce the base flow to the Fox River and other surface waters in the vicinity of the wells. This is to be expected, as the aquifer is unconfined, and very close to recharge features (i.e., streams and wetlands). Because the Fox River is a strong surface water feature, the reduction in base flow to it near the wells may not result in significant degradation; however, the impact to smaller streams and the Vernon Marsh could be significant.

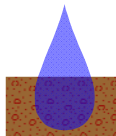


TABLE 1
WAUKESHA WATER UTILITY
WESTERN UNCONFINED SANDSTONE AQUIFER
NEAR-FIELD WELLS

WELL	X	Y	OWNER
<i>SHALLOW</i>			
34302	2115403	967818	Oconomowoc Golf Club
4340	2103047	958044	Not in database
34316	2108357	957561	Paganica Golf Course
34342	2120232	954839	Pabst Farms Land Co.
2072	2124122	956163	Rogers Memorial Hospital
34336	2117638	953551	Pabst Farms Land Co.
34327	2118933	952222	Pabst Farms Land Co.
34320	2121525	953516	Pabst Farms Land Co.
88093	2126697	953601	Nashota House Episcopal Seminary
1595	2133047	953044	Not in database
34337	2113035	951609	Continental Properties
34323	2116327	950922	Pabst Farms Land Co.
34321	2121522	950891	Pabst Farms Land Co.
34354	2113029	948970	Pabst Farms Land Co.
34326	2118927	949589	Pabst Farms Land Co.
34347	2121522	949576	Pabst Farms Land Co.
34350	2107207	945667	Lurvey Sod Farms
16	2098047	935544	Not in database
34346	2115689	935698	Grand Lodge Free & Accepted Masons
1670	2115547	930544	Not in database
<i>DEEP</i>			
88009	2118885	963260	Kettle Moraine Hospital
67782	2131674	947137	Lang Investments
2936	2116328	944289	Oconomowoc Devel. Train. Center
67893	2134442	940430	DNR Lapham Peak State Park
4220	2115019	926791	James & Barbara Michaels
34315	2108357	957561	Paganica Golf Course
34314	2108423	954932	Paganica Golf Course
88044	2129077	963085	Parquelynn Village LLC
65611	2102960	964571	Lake Country Foods
680104	2108619	964343	Not in database
681578	2112523	952170	Not in database
88004	2132143	948728	St. Johns Military Academy
681517	2117116	928254	Not in database
680862	2114442	929763	Not in database
34343	2105611	926713	Kincaid Farms
680105	2109998	964110	Not in database
90188	2115663	943621	Oconomowoc Devel. Train. Center

TABLE 2
WAUKESHA WATER UTILITY
WESTERN WELL SIMULATIONS
SIMULATED DRAWDOWN (FEET)

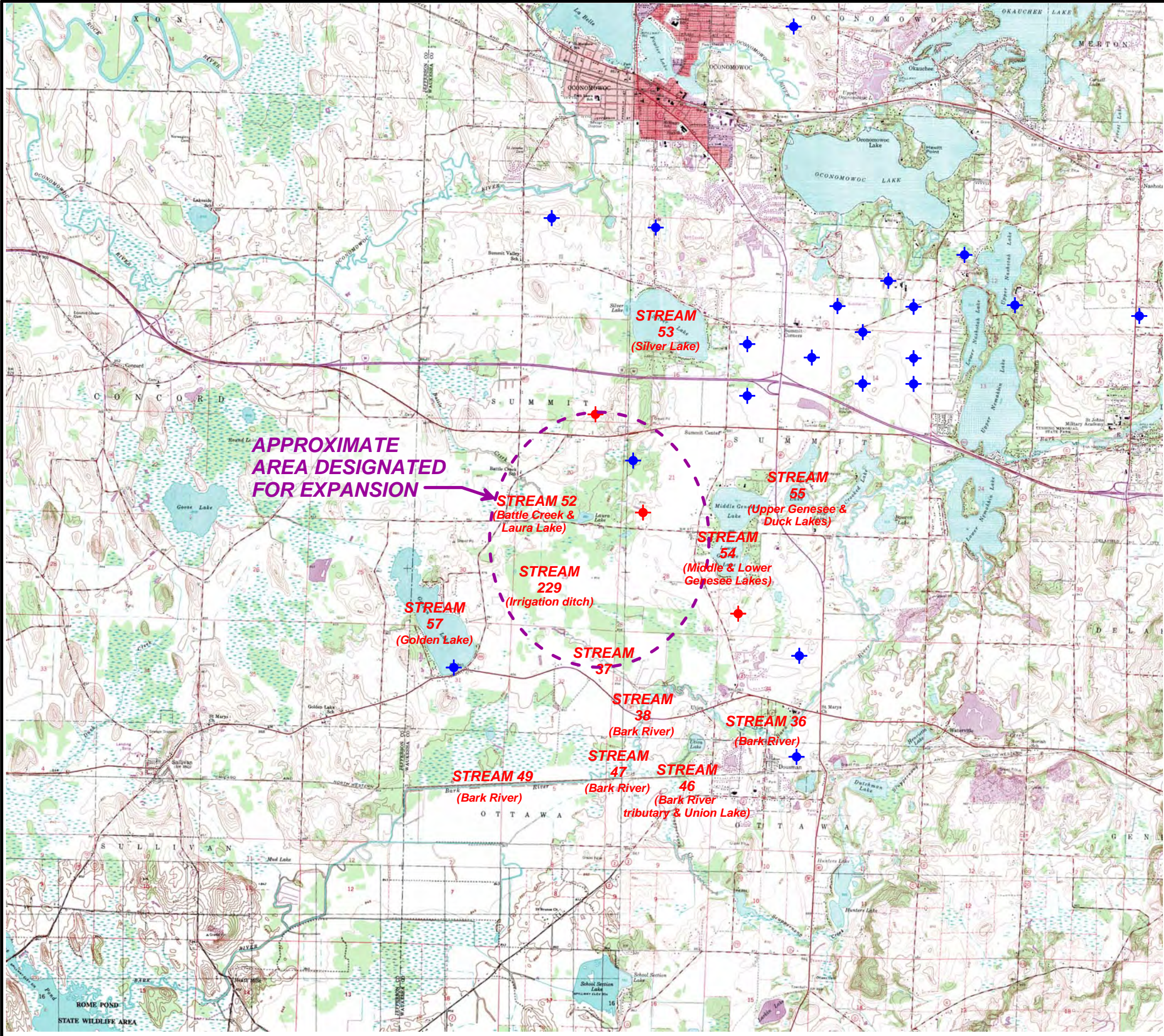
SCENARIO	LAYER 1	LAYER 11
2 MGD	0.28	46
5 MGD	0.7	115
10 MGD	1.4	230
10 MGD - 3 WELLS	1.15	180
15 MGD - 3 WELLS	1.6	240

TABLE 3
WAUKESHA WATER UTILITY
WESTERN WELL SIMULATIONS
BASE FLOW REDUCTIONS IN STREAMS NEAR SIMULATED WELLS
FLows IN GALLONS PER DAY

SCENARIO	FLOW REDUCTION	MODEL STREAM NUMBER												SUMMARY
		36	37	38	46	47	49	52	53	54	55	57	229	
No pumping		2,383,401	519,860	156,033	487,023	146,982	849,204	1,355,451	655,622	525,844	294,039	802,454	538,710	8,714,623
2 MGD - 2 WELLS	BASE FLOW	1,581,023	512,081	152,368	477,523	143,840	833,571	1,318,200	625,926	508,790	282,819	797,218	529,808	7,763,168
	REDUCTION	802,378	7,779	3,665	9,500	3,142	15,633	37,250	29,696	17,054	11,220	5,236	8,901	951,455
	% REDUCTION	34	1	2	2	2	2	3	5	3	4	1	2	11
5 MGD - 2 WELLS	BASE FLOW	1,507,983	486,499	146,907	461,740	138,754	806,643	1,261,427	579,924	481,787	265,241	790,337	516,494	7,443,737
	REDUCTION	875,418	33,361	9,126	25,282	8,228	42,561	94,024	75,698	44,057	28,798	12,118	22,216	1,270,886
	% REDUCTION	37	6	6	5	6	5	7	12	8	10	2	4	15
10 MGD - 2 WELLS	BASE FLOW	1,379,469	479,842	137,557	435,635	130,152	762,062	1,164,636	502,506	436,982	235,770	778,219	494,054	6,936,885
	REDUCTION	1,003,932	40,018	18,476	51,388	16,830	87,142	190,815	153,116	88,862	58,269	24,235	44,656	1,777,738
	% REDUCTION	42	8	12	11	11	10	14	23	17	20	3	8	20
10 MGD - 3 WELLS	BASE FLOW	1,345,600	471,614	135,463	424,864	128,058	755,779	1,196,725	518,962	422,470	237,266	779,640	496,522	6,912,964
	REDUCTION	1,037,801	48,246	20,570	62,159	18,924	93,425	158,726	136,660	103,374	56,773	22,814	42,187	1,801,659
	% REDUCTION	44	9	13	13	13	11	12	21	20	19	3	8	21
15 MGD - 3 WELLS	BASE FLOW	1,249,923	456,953	129,703	409,904	122,597	728,702	1,147,806	478,795	390,007	220,735	774,255	485,302	6,594,682
	REDUCTION	1,133,478	62,907	26,330	77,119	24,385	120,503	207,645	176,827	135,837	73,304	28,200	53,407	2,119,940
	% REDUCTION	48	12	17	16	17	14	15	27	26	25	4	10	24

TABLE 4
WAUKESHA WATER UTILITY
SIMULATED PUMPING RATES
EXISTING SANDSTONE WELLS

WELL	PUMPING RATE (GPD)	
	AVERAGE	1/4 RATE
2	530,000	132,500
3	542,000	135,500
5	684,000	171,000
6	1,296,000	324,000
7	756,000	189,000
8	1,224,000	306,000
9	1,656,000	414,000
10	1,800,000	450,000



- LOCATION OF SIMULATED WELL FOR WAUKESHA EXPANSION
- SIMULATED EXISTING HIGH CAPACITY WELLS

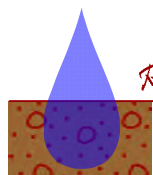
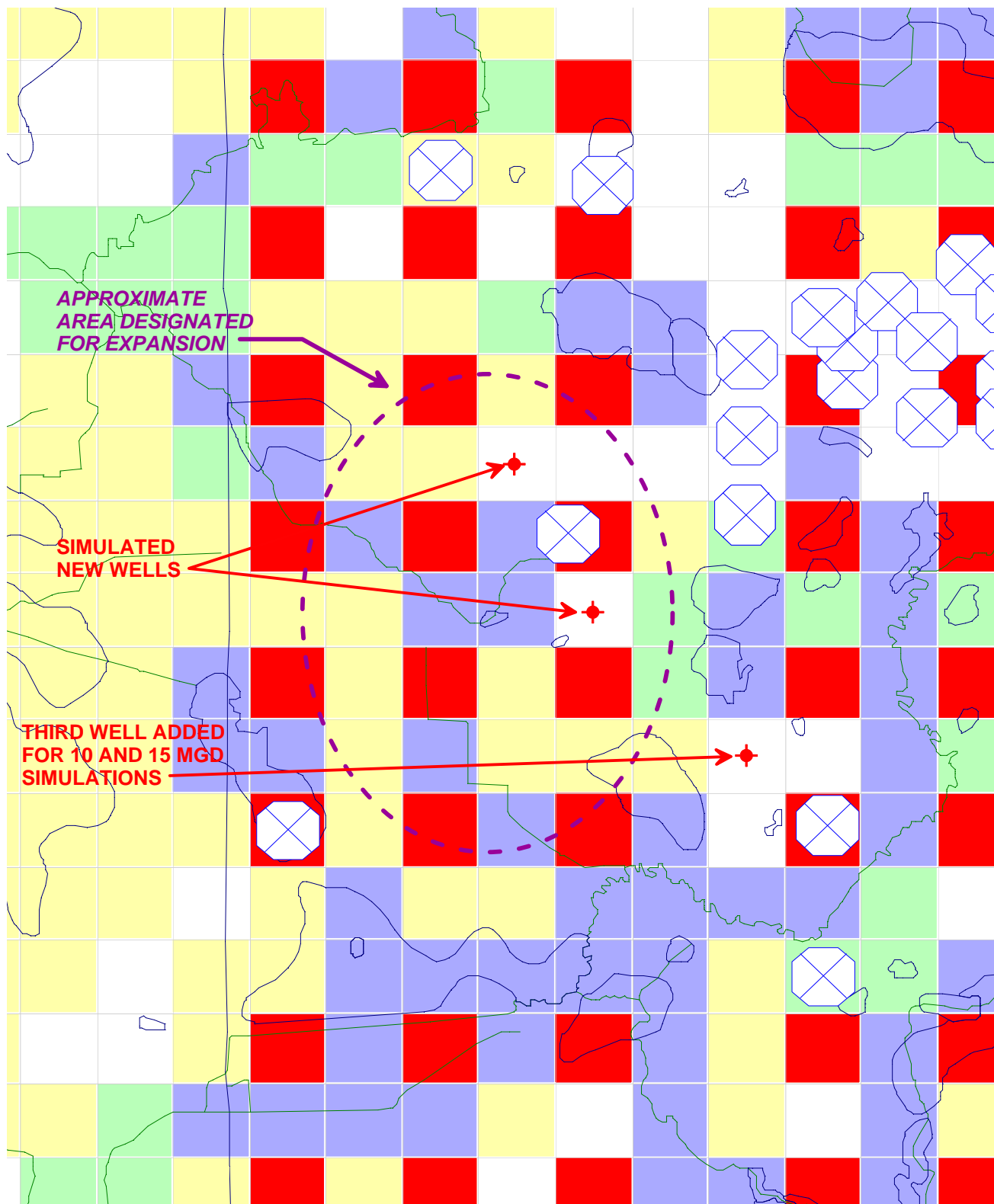


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WAUKESHA WATER UTILITY WESTERN UNCONFINED AQUIFER MODEL STREAM DESIGNATIONS			FIGURE 1
DRAWN BY	PROJ. No.	DATE	FILE
RN	10-201	08 FEB 11	STREAMS



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WAUKESHA WATER UTILITY WESTERN UNCONFINED AQUIFER MODEL GRID IN STUDY AREA

DRAWN BY

PROJ. No.

DATE

FILE

RN

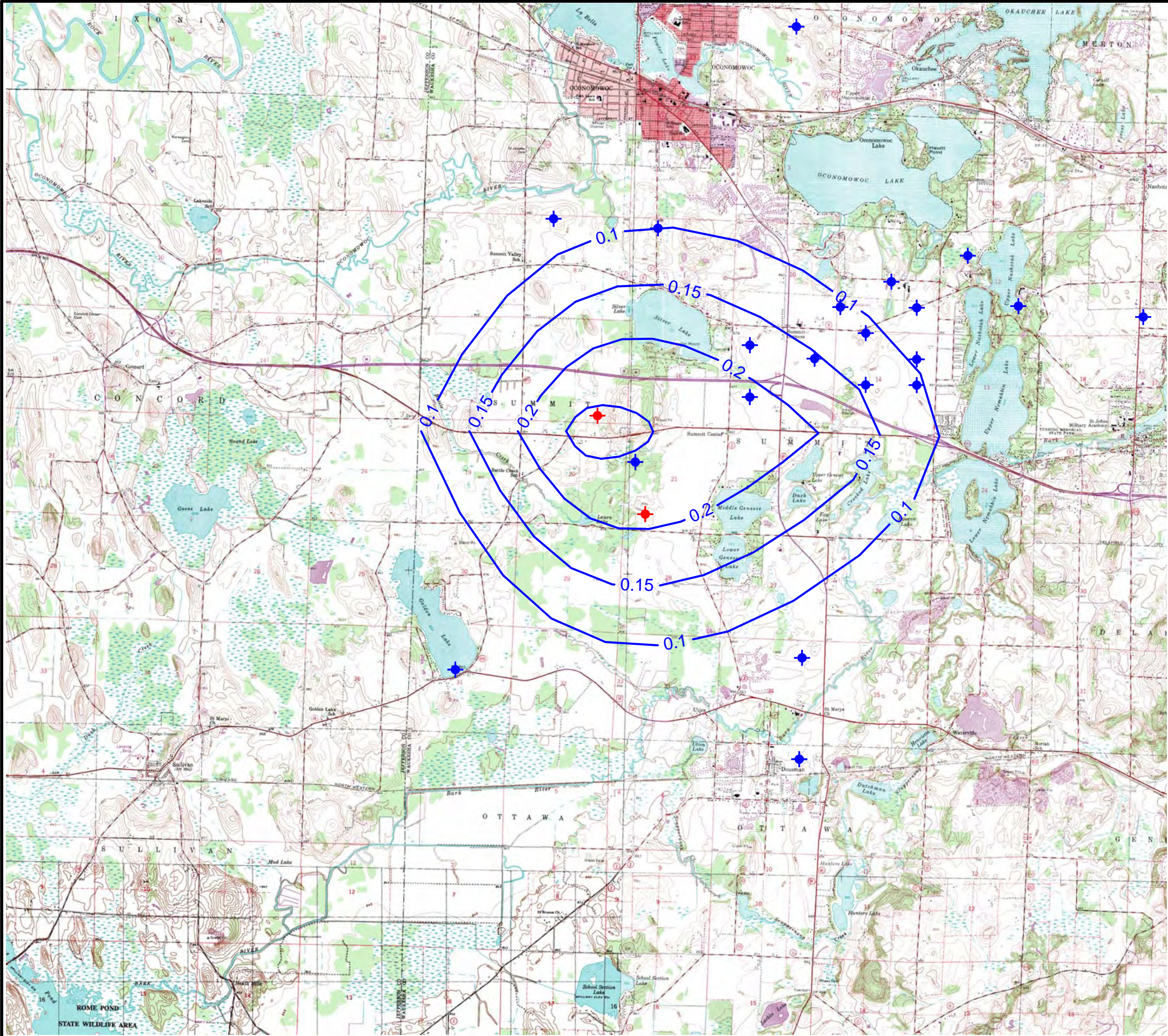
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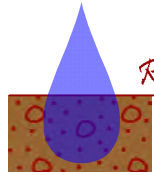
MODEL

FIGURE

2



- 0.2 — SIMULATED DRAWDOWN IN FEET
- ◆ EXISTING SHALLOW HIGH CAPACITY WELL
- ◆ SIMULATED NEW WELL



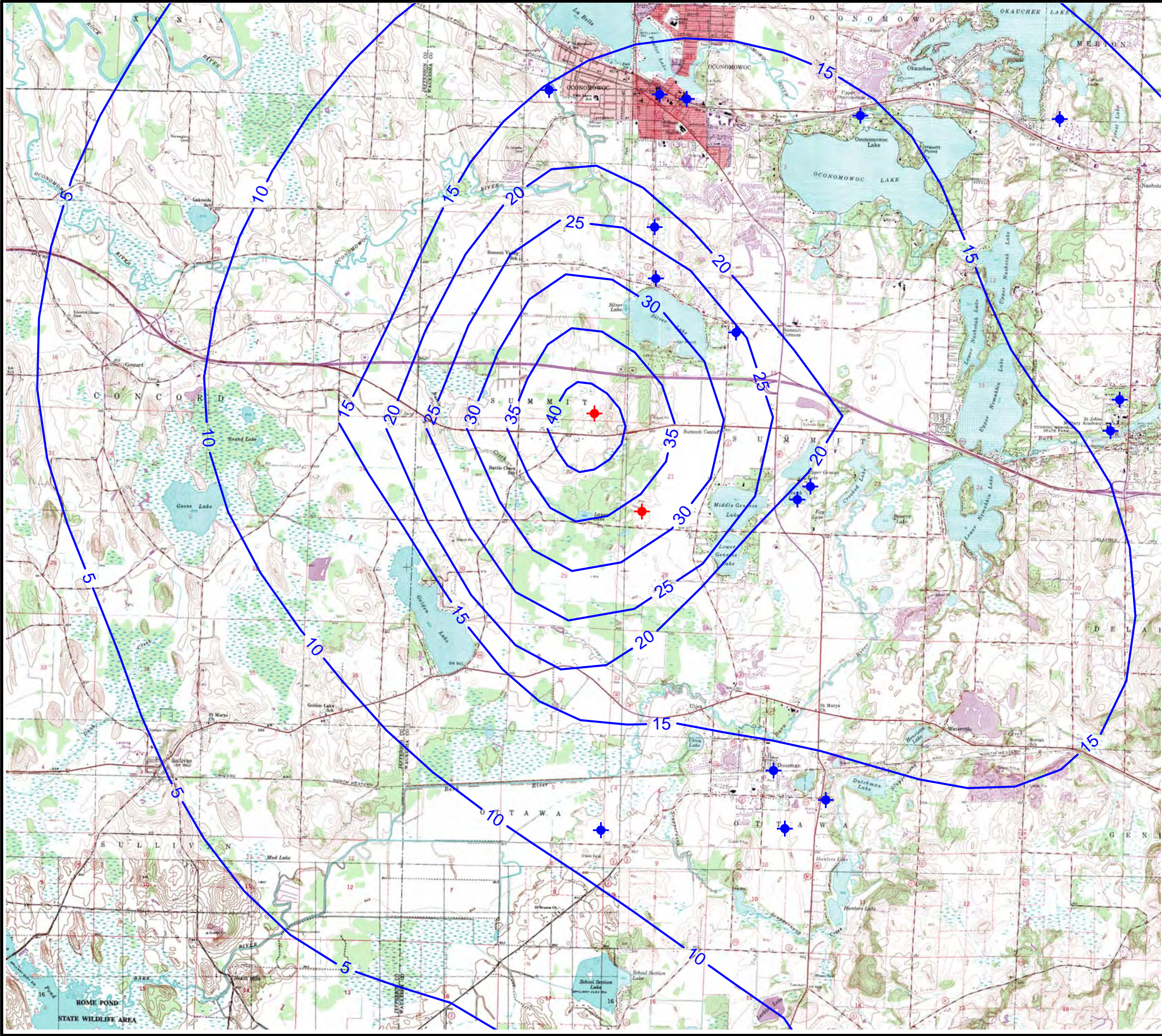
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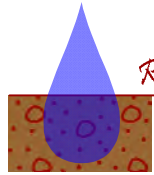
WAUKESHA WATER UTILITY
WESTERN UNCONFINED AQUIFER
SIMULATED DRAWDOWN - 2 MGD
LAYER 1

FIGURE
3

DRAWN BY	PROJ. No.	DATE	FILE
RN	10-201	26 JAN 11	2MGD DDN L1



- 10 ——— SIMULATED DRAWDOWN IN FEET
- ◆ EXISTING DEEP HIGH CAPACITY WELL
- ◆ SIMULATED NEW WELL



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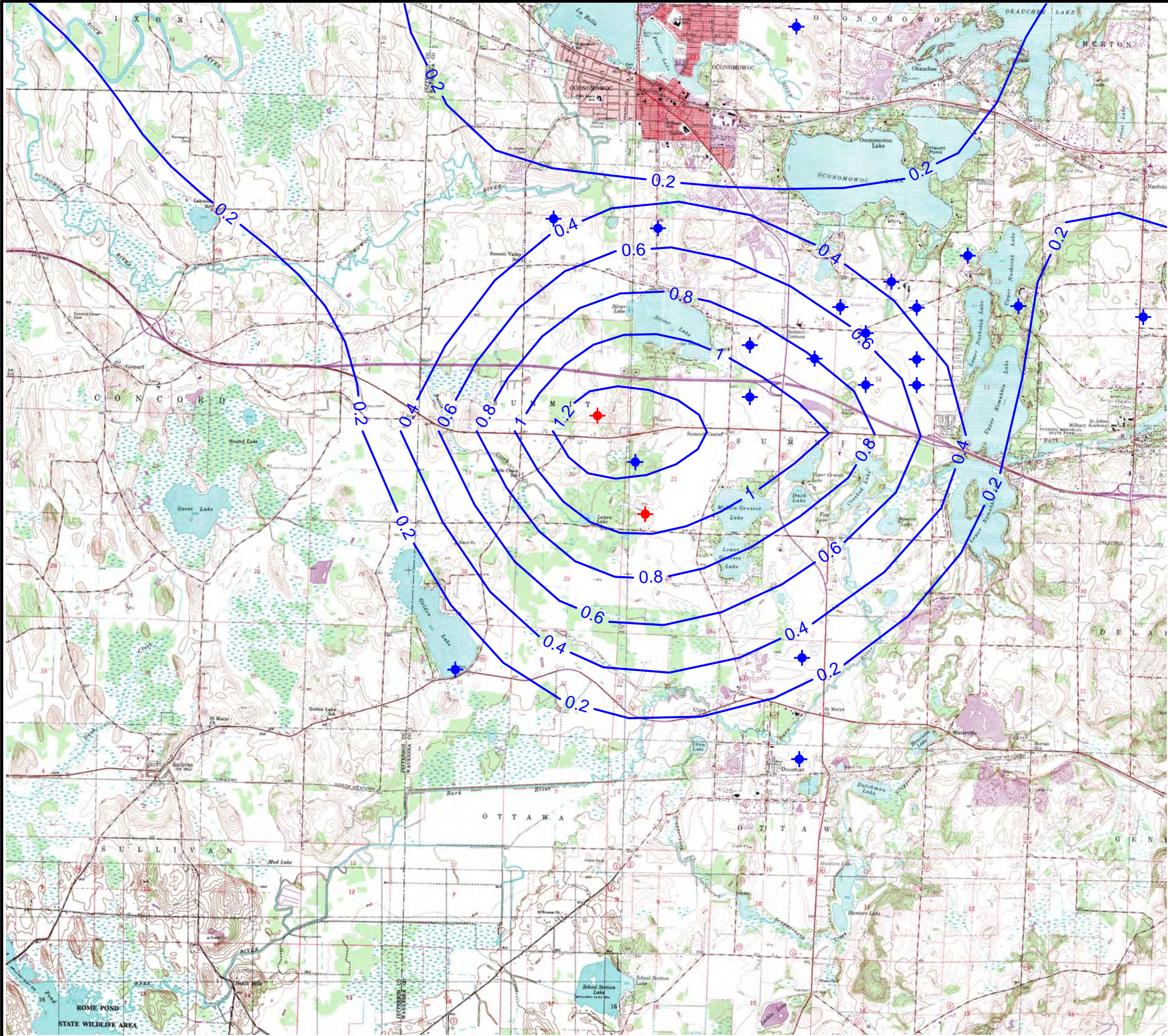
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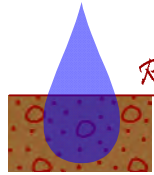
WAUKESHA WATER UTILITY
WESTERN UNCONFINED AQUIFER
SIMULATED DRAWDOWN - 2 MGD
LAYER 11

FIGURE
4

DRAWN BY	PROJ. No.	DATE	FILE
RN	10-201	26 JAN 11	2MGD DDN L11



- 0.2 — SIMULATED DRAWDOWN IN FEET
- ◆ EXISTING SHALLOW HIGH CAPACITY WELL
- ◆ SIMULATED NEW WELL



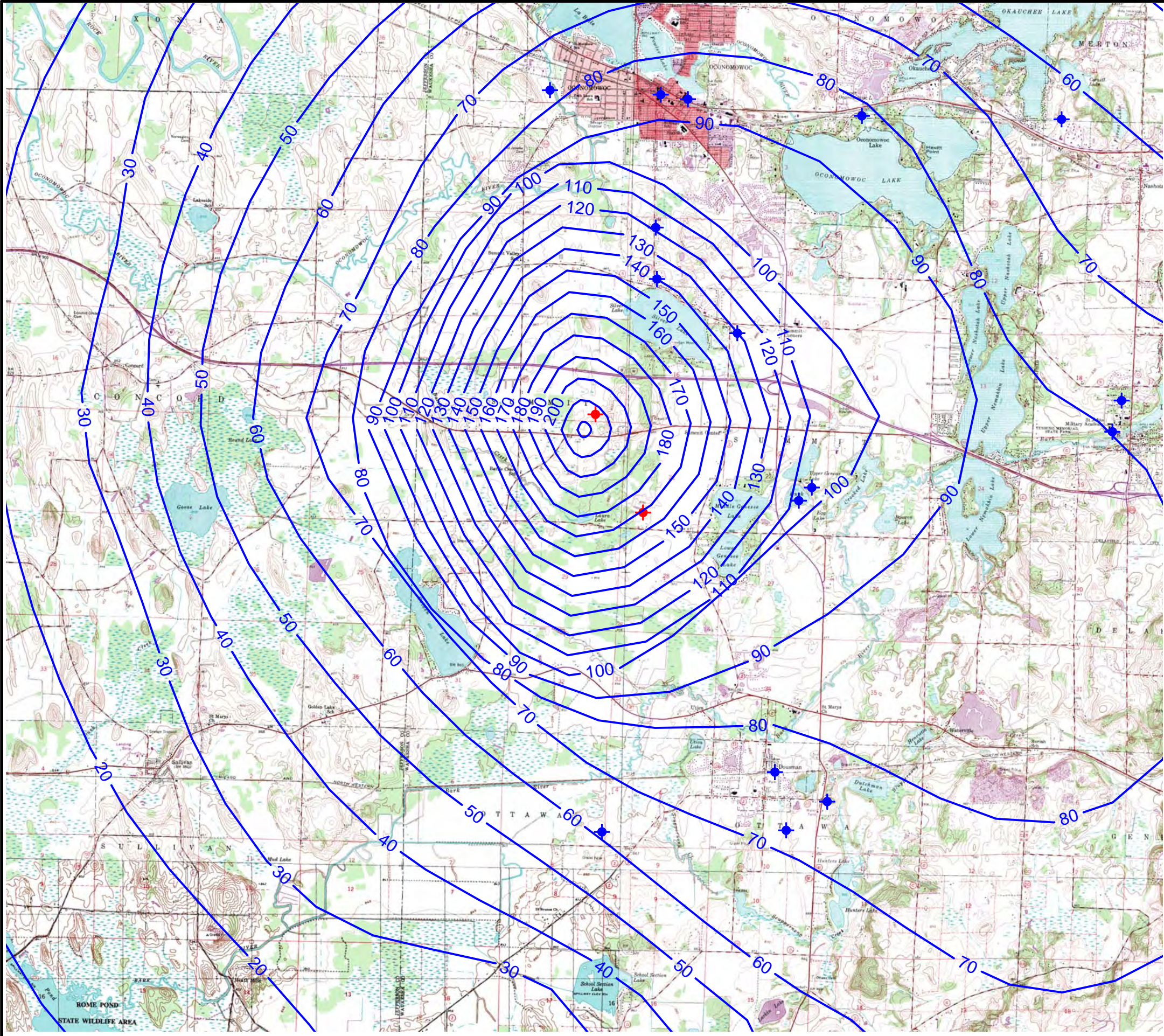
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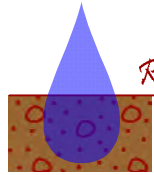
WAUKESHA WATER UTILITY
WESTERN UNCONFINED AQUIFER
SIMULATED DRAWDOWN - 10 MGD
LAYER 1

FIGURE
5

DRAWN BY	PROJ. No.	DATE	FILE
RN	10-201	26 JAN 11	10MGD DDN L1



- 10 — SIMULATED DRAWDOWN IN FEET
- ★ EXISTING DEEP HIGH CAPACITY WELL
- ★ SIMULATED NEW WELL



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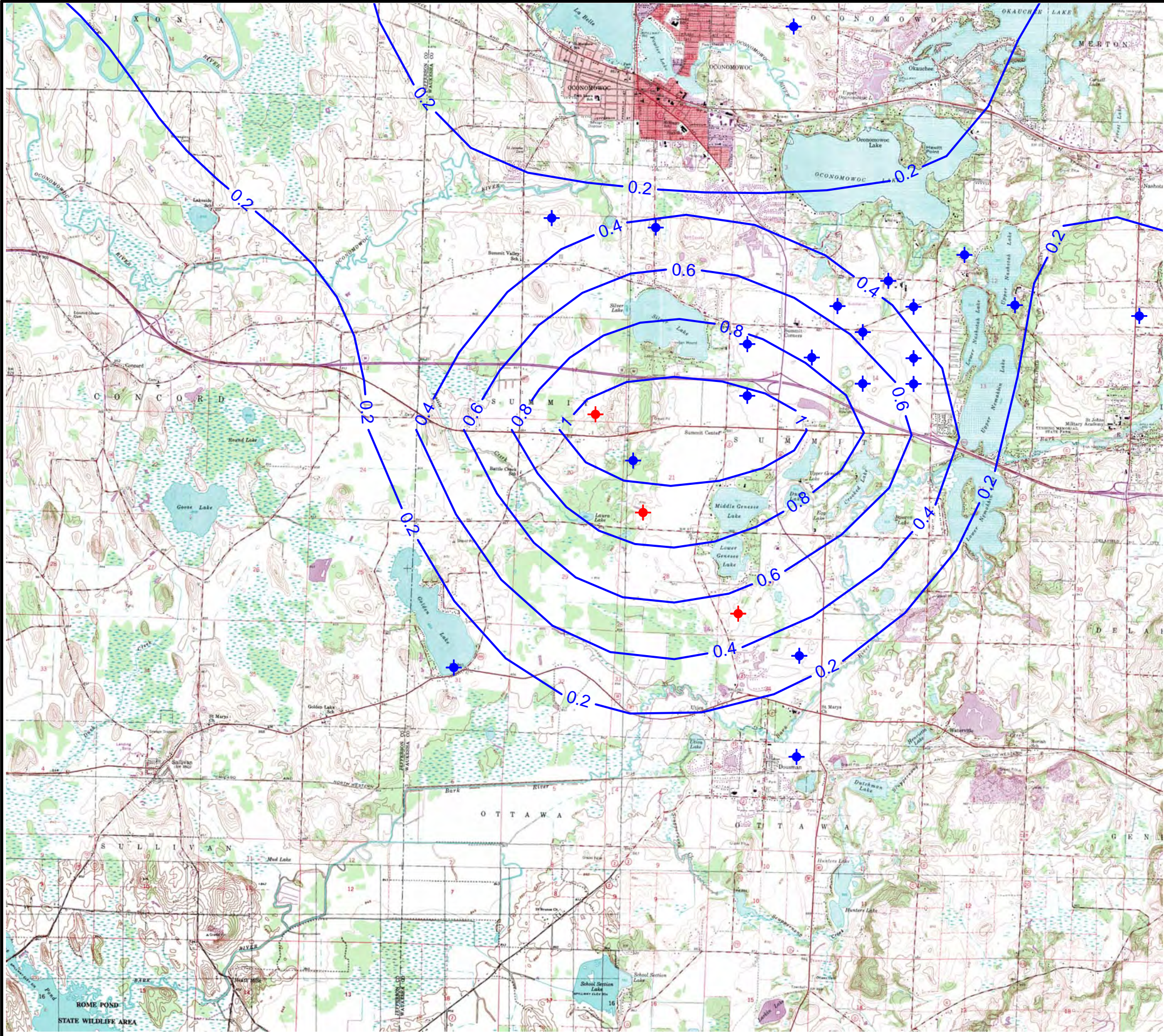
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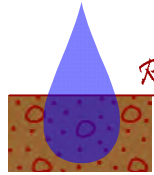
WAUKESHA WATER UTILITY
WESTERN UNCONFINED AQUIFER
SIMULATED DRAWDOWN - 10 MGD
LAYER 11

FIGURE
6

DRAWN BY	PROJ. No.	DATE	FILE
RN	10-201	26 JAN 11	10MGD DDN L11



- 0.2 — SIMULATED DRAWDOWN IN FEET
- ◆ EXISTING SHALLOW HIGH CAPACITY WELL
- ◆ SIMULATED NEW WELL



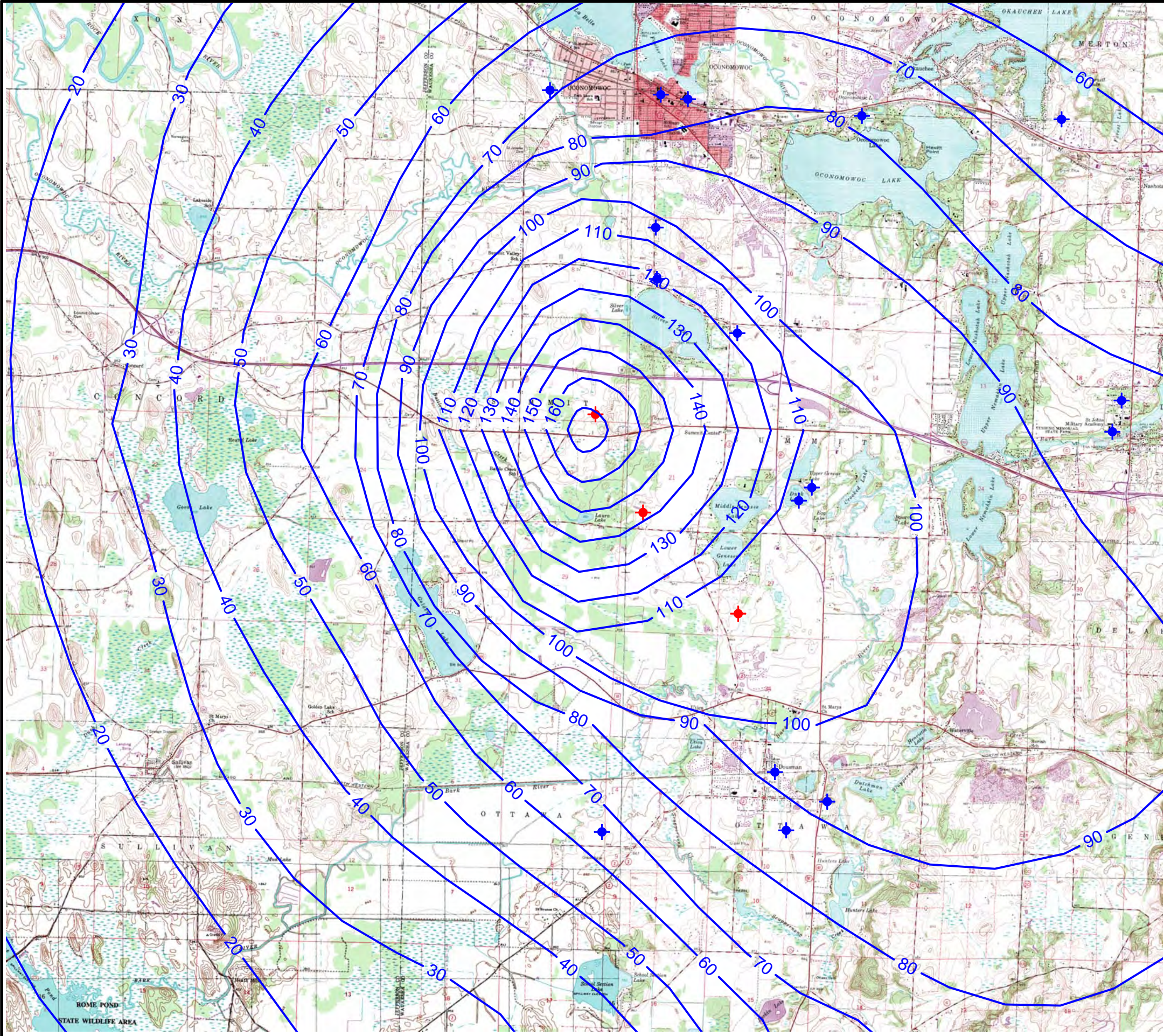
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WAUKESHA WATER UTILITY
WESTERN UNCONFINED AQUIFER
SIMULATED DRAWDOWN - 10 MGD
3 WELLS - LAYER 1

FIGURE
7

DRAWN BY	PROJ. No.	DATE	FILE
RN	10-201	26 JAN 11	10MGD DDN L1 3



- 10 ——— SIMULATED DRAWDOWN IN FEET
- ◆ EXISTING DEEP HIGH CAPACITY WELL
- ◆ SIMULATED NEW WELL

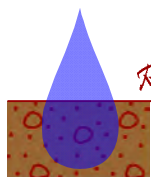
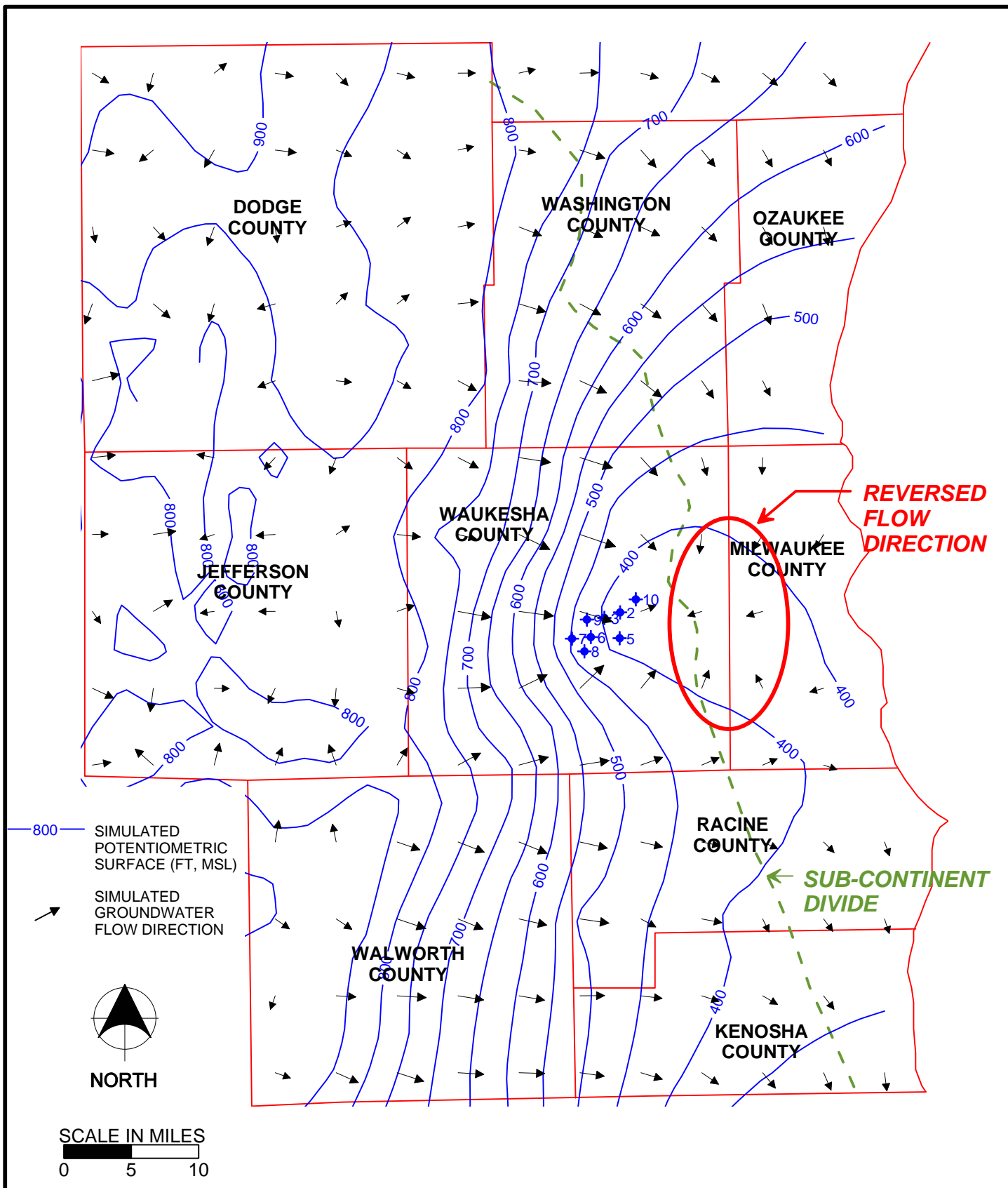




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WAUKESHA WATER UTILITY WESTERN UNCONFINED AQUIFER SIMULATED DRAWDOWN - 10 MGD 3 WELLS - LAYER 11			FIGURE 8
DRAWN BY	PROJ. No.	DATE	FILE
RN	10-201	26 JAN 11	10MGD DDN L11 3



RJN Environmental Services, LLC

Surface Water Studies
Groundwater Studies
Site Investigations

4631 COUNTY ROAD A, OREGON, WISCONSIN 53575 (608) 576-3001

WAUKESHA WATER UTILITY EXISTING SANDSTONE WELLS SIMULATED AT APPROVED RATE

DRAWN BY

RN

PROJ. No.

10-201

DATE

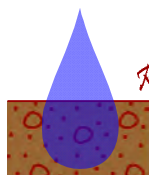
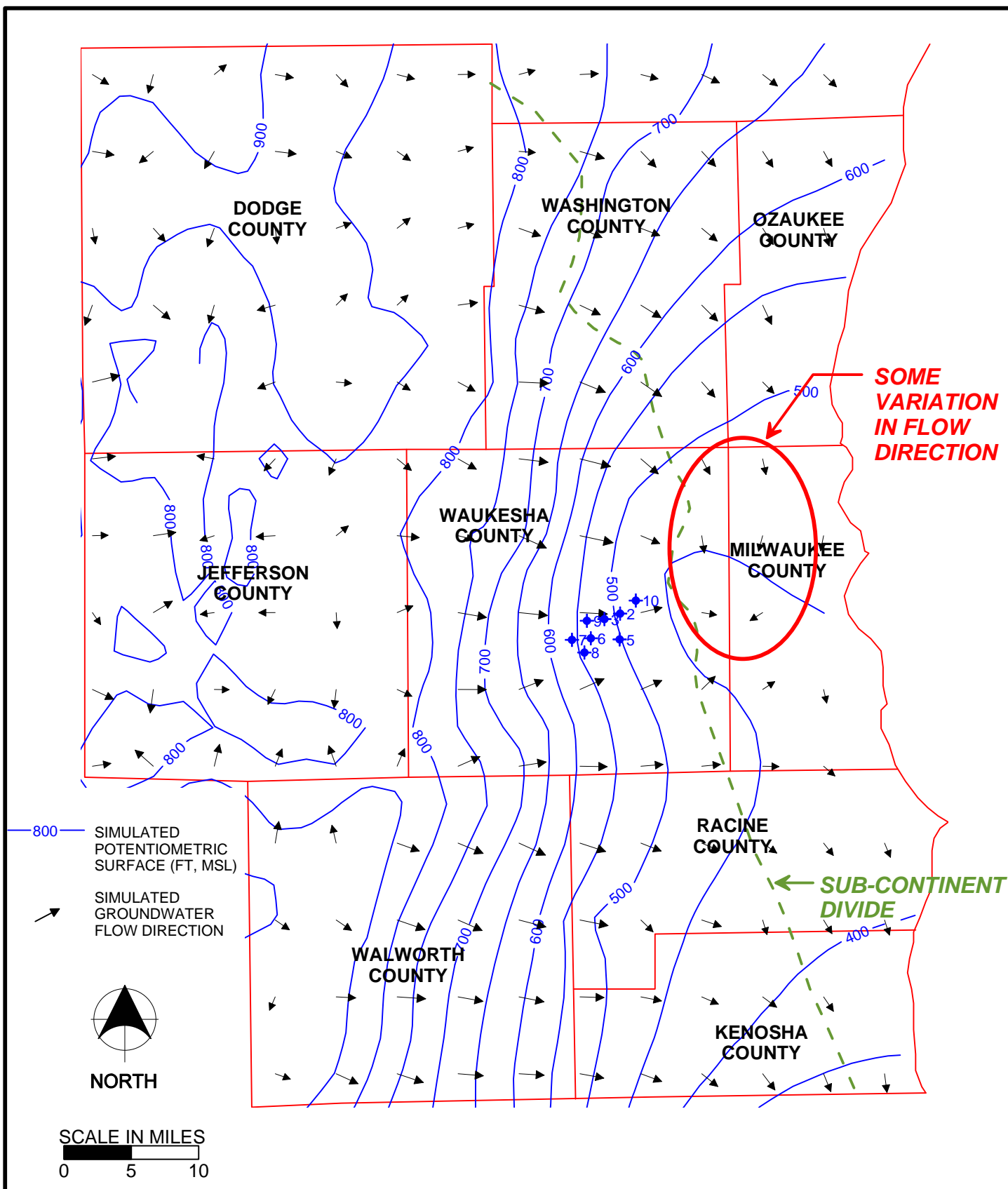
21 FEB 11

FIGURE

9

FILE

WAUK APPROVED



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Surface Water Studies
Groundwater Studies
Site Investigations

4631 COUNTY ROAD A, OREGON, WISCONSIN 53575 (608) 576-3001

WAUKESHA WATER UTILITY EXISTING SANDSTONE WELLS SIMULATED AT 1/4 RATE

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FIGURE

10

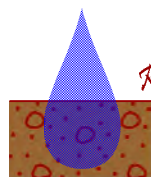
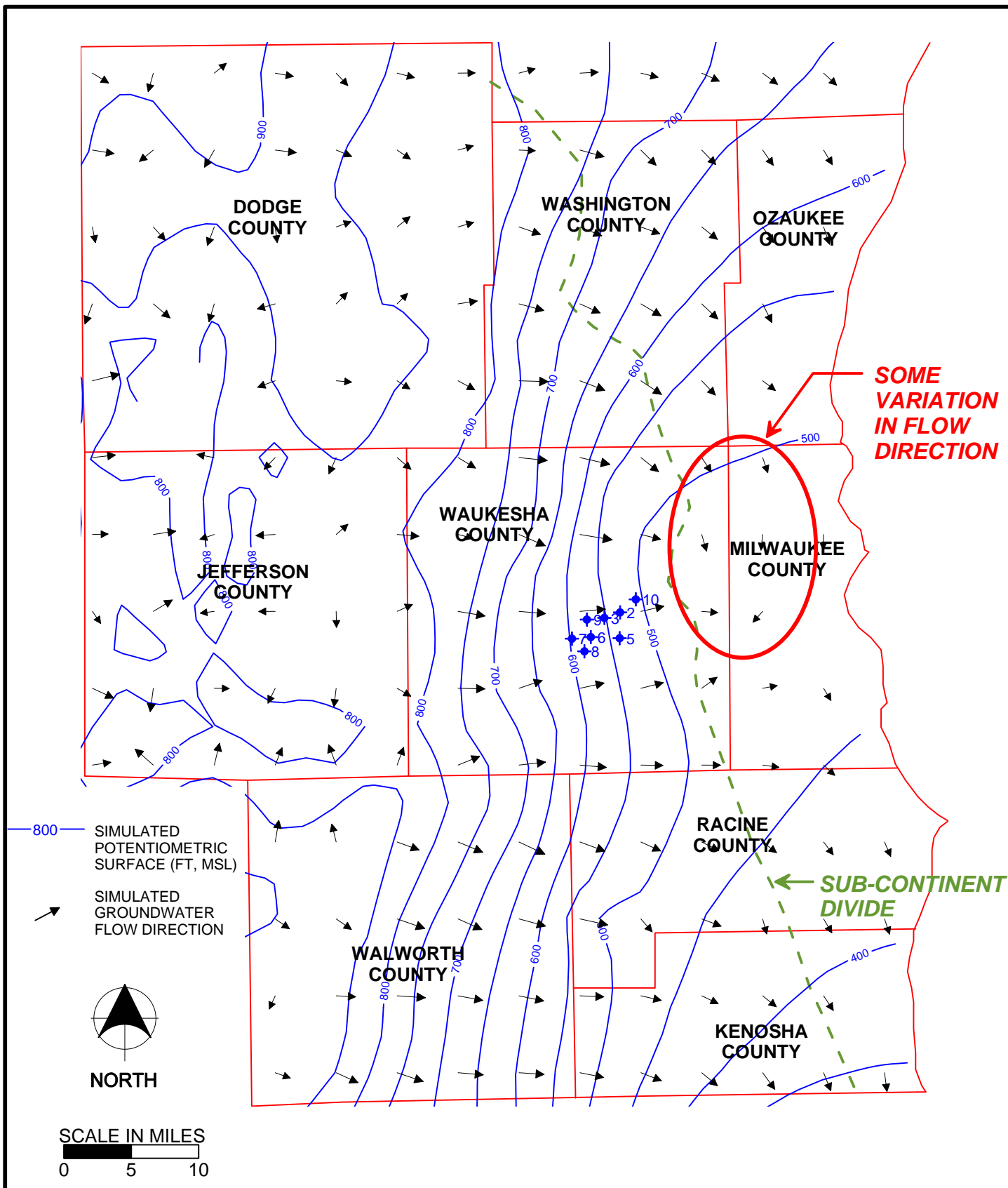
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WAUK FOURTH



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Surface Water Studies
Groundwater Studies
Site Investigations

4631 COUNTY ROAD A, OREGON, WISCONSIN 53575 (608) 576-3001

WAUKESHA WATER UTILITY EXISTING SANDSTONE WELLS NOT PUMPING

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PROJ. No.

10-201

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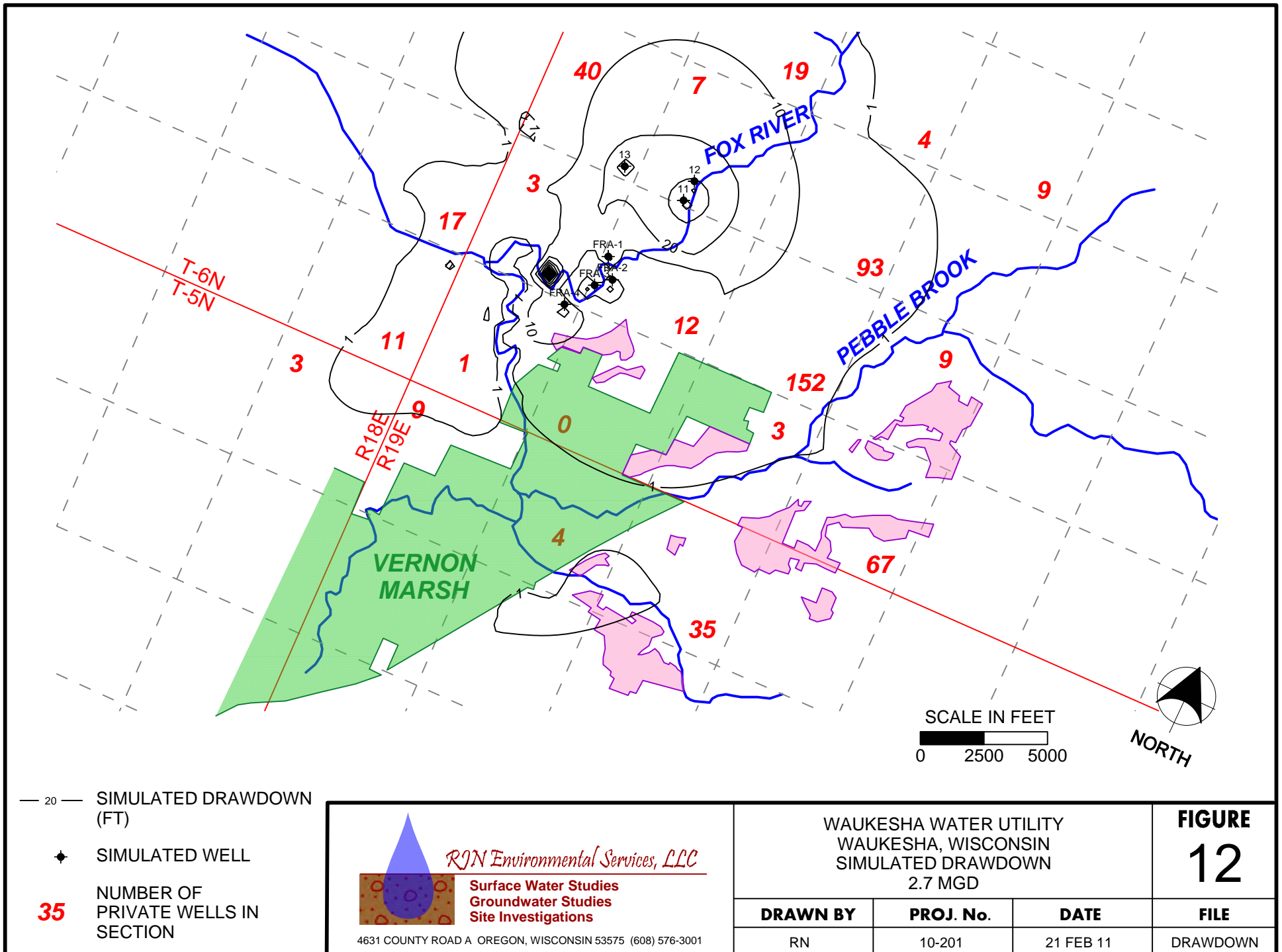
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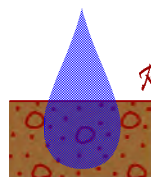
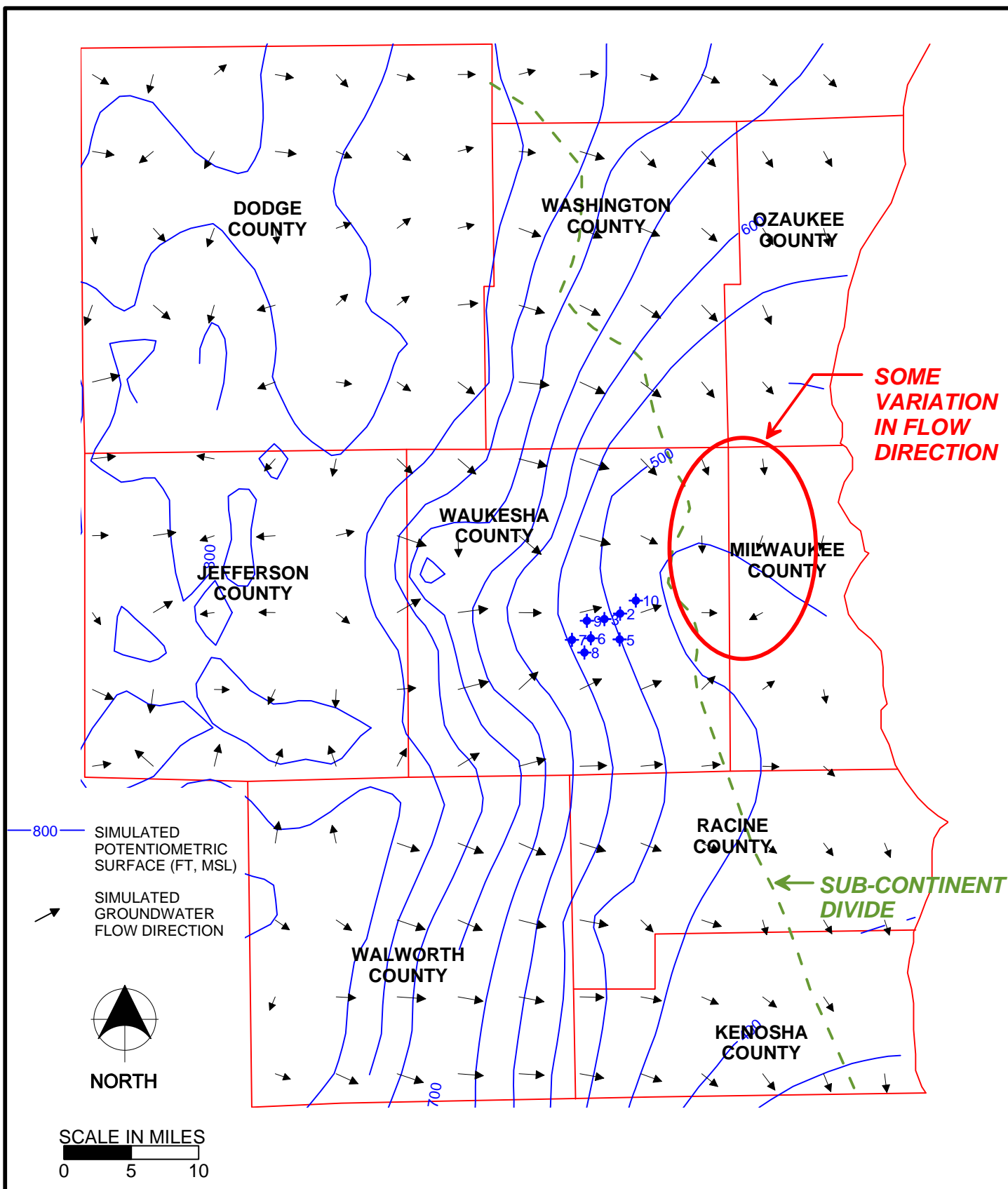
FIGURE

11

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WAUK NO PUMP





RJN Environmental Services, LLC

Surface Water Studies
Groundwater Studies
Site Investigations

4631 COUNTY ROAD A, OREGON, WISCONSIN 53575 (608) 576-3001

WAUKESHA WATER UTILITY EXISTING SANDSTONE WELLS NOT PUMPING & 10 MGD FROM WEST

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DATE

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FIGURE

13

FILE

10 WEST

TABLE 5
WAUKESHA WATER UTILITY
SHALLOW WELL SCENARIO¹
BASE FLOW ESTIMATES

RESOURCE	BASE RUN (GPD)	TEST SCENARIO	
		GPD	PERCENT REDUCTION
FOX RIVER	1,702,810	96,000	94
PEBBLE BROOK	3,399,693	2,750,000	19
VERNON MARSH	2,817,027	1,770,000	37
MILL BROOK	687,910	310,000	55

¹ Wells 11, 12 and 13 pumping at a combined rate of 1.2 mgd;
Fox River alluvial wells pumping at a combined rate of 1.5 mgd.

Attachment WS8
Silurian Dolomite Aquifer Report

February 28, 2011

Ms. Nancy A. Quirk, P.E.
Technical Services Manager
City of Waukesha Water Utility
115 Delafield Street
Waukesha, WI 53188

RE: Response to DNR Request for Information
On the Silurian Dolomite

Dear Ms Quirk:

We are providing this letter report in response to your request for assistance with the work the Waukesha Water Utility (WWU or the Utility) is performing to address the issues related to use of the Silurian dolomite aquifer (Silurian dolomite or dolomite) as a source of supply for the Utility. We understand this was prompted by a request from the Wisconsin Department of Natural Resources (WDNR) in a letter dated December 2, 2010 to the City of Waukesha. The objective of this report is to offer response to WDNR's comment in that letter, WS8, as follows:

"WS8. Although the Silurian dolomite is dense and has limits to storing and transmitting water, several municipalities have been successful in identifying areas within fractured zones of the dolomite aquifer that have resulted in producing wells with acceptable water yields. The 2002 Future Water Supply Study states that the probability of obtaining a reasonable well yield from the fractured Silurian dolomite aquifer occurs when the aquifer is at least 150 – 200 feet thick. The study also states that there are several municipalities in the area with wells producing from intervals of the fractured dolomite aquifer at a rate of 1,400 gpm, although capacities of 500 – 700 gpm are more common. There are areas in the northeast portion the City of Waukesha and areas southeast of the City of Waukesha where the dolomite aquifer is at least 200 feet thick.

Describe in greater detail the degree to which the areas to the northeast and southeast have been assessed for potential well locations. Also, provide any geophysical data that has been collected identifying any fractured zones in the Silurian dolomite."



Letter to Ms. Nancy A. Quirk, P.E.
Technical Services Manager
City of Waukesha Water Utility
February 28, 2011
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Our scope of work as presented to the Utility in our January 7, 2011 proposal, was as follows:

Task 1 – Data Collection and Review

- a. Reviewed all reports and data completed by R/M.
- b. Collect past known reports done by others relating to the Silurian dolomite.
- c. Collect past reports for neighboring communities relating to the Silurian dolomite. This only includes reports for communities in the northeastern and southeastern border areas that identify properties of the Silurian dolomite. These are also limited to reports we have readily available in-house (which is most of the work done for this area).
- d. Review and collate pertinent sections of these data sources.

Task 2 – Preparation of Exhibits

- a. Using the review data, prepare a base exhibit showing the extent and depth of the Silurian dolomite in the Waukesha area.
- b. Using the base Exhibit add existing local municipal dolomite wells, the capacity of those wells, and any fracture trace information to the exhibit.
- c. These exhibits will be used to visually support the conclusions that are developed in Task 3 – Analysis and Reporting.

Task 3 – Analysis and Reporting

- a. Conduct the required analysis of the exhibits and data and prepare a brief letter report summarizing the known, available, information on the Silurian dolomite in the area, which will include the following:
 - 1) A brief summary of the exploration work performed for the letter report including a listing of the information collected and reviewed as part of these efforts.
 - 2) A statement on whether this aquifer is, or is not, a reasonable water supply source for the City of Waukesha, considering other water sources available.



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Technical Services Manager
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3) Exhibits and Appendices.

- b. Submit a draft of the letter report to WWU and CH2M Hill (Hill) for review and comment.
- c. Incorporate WWU and Hill comments, as appropriate, and submit a final report to WWU.

Data Collection and Review

A significant amount of data on the Silurian dolomite exists for the area in southeastern Wisconsin within and adjacent to the City of Waukesha. Many of the studies to site wells in the dolomite have been performed by hydrogeologists familiar with the area and the dolomite aquifer. The nature of these studies can be divided into four groups or phases:

1. Regional Studies – Many regional studies have been conducted on the dolomite in southeastern Wisconsin. These studies include Master Thesis's, Doctoral Dissertations, University studies and regional planning efforts. These studies focus on the general properties of the dolomite and it's availability for use as an aquifer of significance for the area.
2. Phase 1 Studies – These are preliminary well siting studies that identify the environmental and regulatory issues that govern the placement of wells. The goal of a Phase 1 study is to identify potential areas where high capacity dolomite wells may be constructed. The studies typically identify the location of potential contaminant sources, depth to bedrock, thickness of the dolomite, location of fracture traces, and recommendations of specific sites that appear favorable for further exploration to more clearly identify the potential for construction of a municipal dolomite well.
3. Phase 2 Studies – These studies are generally site specific and are designed to assess the possibility of constructing a dolomite production well on one or more sites. They often include the results of geophysical investigations on specific sites to locate fracture zones. These geophysical investigations may include seismic refraction to identify the depth of the dolomite, electrical resistivity, spontaneous potential measurements or geothermal measurements to locate fracture zones, and test bore drilling to verify geophysical measurements and obtain a preliminary estimate of the aquifer capacity and water quality.



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4. Phase 3 Studies – These studies generally involve the construction of test wells and production wells on specific sites that have received construction approval from the DNR. The reports will typically document the geologic and aquifer hydraulic and chemical properties of the dolomite aquifer.

As part of the consulting services provided by Ruekert/Mielke, Inc. (R/M), Aquifer Science and Technology (AST) a division of Ruekert/Mielke, has served as hydrogeologic consultants to local communities since 1999. AST has performed numerous well siting studies, which include the completion of several high capacity dolomite wells, for local communities during this time. Studies of this nature have also been performed by other consultants and well drillers. The data for the region is fairly extensive. To address WDNR's request, we have located and reviewed those reports that relate to the area in and around the Waukesha future water service area, and were designed to locate specific well sites. We have also gathered and reviewed previously submitted data on the regional properties of the aquifer that have been submitted in other reports WWU has commissioned. A summary of regional aquifer properties follows.

Regional Aquifers

The groundwater that is obtained from wells in southeastern Wisconsin is found in three distinct water bearing geologic formations or aquifers. The first of the three aquifers consists of the unconsolidated sand and gravel layers of that lie on top of the bedrock. The extent and thickness of these layers do not provide significant groundwater yields in all areas. Sand and gravel deposits suitable for use as aquifers for municipal wells are difficult to locate. The thickness of the unconsolidated material underlying varies throughout the City. Wells finished in the sand and gravel formations have a wide range of capacity, from 10 to 1,500 gallons per minute or more. Since this aquifer is closest to the ground surface, it is most susceptible to contamination from surface sources. Proper well siting, and construction and wellhead protection can, however, minimize the potential for contamination.

The next lowest aquifer consists of dolomitic bedrock known locally as the "Niagara dolomite". The Niagara dolomite is also identified as the Silurian dolomite on a more regional basis; this identification relates to the geologic age in which the aquifer was formed. This aquifer is used as a source for numerous (approximately 30) municipal wells in eastern Waukesha County.



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The Silurian dolomite contains numerous fractures, voids, and bedding plane enlargements that often act as open conduits for groundwater migration. Groundwater can flow through these open conduits rapidly, both horizontally and vertically, without any significant filtration. As a result, any contamination that enters the aquifer can be transported from hundreds to thousands of feet without significant attenuation. Therefore, selection of a dolomite well site that has been adequately screened for the presence of potential contaminant sources and suitable thickness and permeability of the overlying unconsolidated material is critical.

The distribution of the fractures and voids in the dolomite aquifer is highly variable making it difficult to predict the primary pathways of groundwater migration. When viewed on large scale, the general pattern of groundwater flow resembles the typical uniform flow pattern of uniform porous aquifers. On a smaller scale, however, discrete flow paths exist which cause groundwater to flow at higher rates and in different directions than expected. Therefore, while it is possible to describe the average bulk groundwater flow pattern of this aquifer on a regional basis, it is usually not possible to describe the fracture flow pattern to a particular well.

Wells completed in the dolomite have widely varying capacities that are related to site-specific geologic constraints, well construction and regulatory requirements. WAC ch. NR 811 specifies a minimum of 60 feet of protective casing be provided to guard against surface contamination influencing the water quality. As an example, the Village of Sussex, which lies directly north of the City of Waukesha, has similar geology to Waukesha. Dolomite deposits are close to the surface and are mined for both stone and gravel just as the quarries directly adjacent to Waukesha are. Sussex was forced to install a municipal water system in the 1970's because the shallow bedrock was serving as a conduit for bacteriological contamination in wells completed in the dolomite. Now high capacity wells completed in the dolomite within a radius of 1/2 mile are typically required to be cased to a depth that equals the elevation of the floor of the quarry (although WDNR will review each well and determine the required casing depth on a case by case basis). These casing restrictions are in place so that contamination should not recur in the municipal system if they were to construct dolomite wells.

Based on our recent experience siting municipal dolomite aquifer wells in southeastern Wisconsin high capacity wells will typically require a minimum of 100 feet of available dolomite formation for the well bore below the casing. This increases the likelihood that the well bore will intercept open vertical fractures and associated bedding planes that can carry adequate quantities of water to a well. Even so, there is no guarantee that



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Technical Services Manager
City of Waukesha Water Utility
February 28, 2011
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a sufficient capacity of water will be available from a well finished in the Dolomite. Some of the unknowns regarding output include:

- Will the well intercept the fracture zone
- Will the fractures and bedding planes be filled with secondary mineralization or tight clay-sized materials that are unable to be removed through stimulation techniques.
- Will the fractures and bedding planes provide conduits to surface contamination, even with the 60 feet minimum casing depth.
- What will be the water quality as it relates to iron, manganese, hardness and arsenic, and is it cost effective to remove any of these.

Based upon the unknowns and our experience in the area, we feel that the capacity from a dolomite well that can be constructed with the restrictions mentioned is approximately 300 - 600 gpm. Some wells may produce only 100 gpm and some may exceed 700 gpm, but a range of 300 – 600 gpm, with an average of 450 gpm seems reasonable.

The next lowest aquifer is the sandstone aquifer. The sandstone aquifer of southeastern Wisconsin consists of interbedded sandstone, dolomite and shale units of Ordovician to Cambrian age. The aquifer is separated from the two shallower aquifers previously described by a regional confining unit that consists of the Maquoketa formation and the underlying Galena-Platteville dolomite. This confining unit restricts the vertical migration of water between the upper aquifers and the sandstone aquifer. The Maquoketa formation generally consists of a massive shale unit. The Wisconsin Department of Natural Resources is concerned about contaminant transport from the upper limestone to the sandstone aquifer. For this reason, it does not allow wells to be drilled which are open to both aquifers. The Maquoketa confining unit disappears approximately ten miles west of the City of Waukesha. The area where the confining unit is absent comprises the major recharge area for the sandstone aquifer. Precambrian granite and quartzite deposits lie immediately beneath the sandstone aquifer. These units are essentially impermeable and serve as the base of the sandstone aquifer.



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Dolomite Aquifer Information

To prepare this description of the information available for the Dolomite aquifer in the vicinity of Waukesha, we collected and reviewed the following reports and data:

Geophysical Exploration Program for municipal well sites, City of Muskego, Waukesha County Wisconsin, Northern Environmental, April 14, 1994.

Geologic Reconnaissance Study for Shallow Aquifer Well Siting, Village of Germantown, Washington County, Wisconsin, Ruekert/Mielke, Inc., August 2002.

Report on Southwest Area Water Facilities, Town of Pewaukee Sanitary District No. 3, Waukesha County Wisconsin, Ruekert/Mielke, Inc. 1991.

Results of The Electrical Resistivity Geophysical Investigations, Village of Germantown, Wisconsin, Washington County, Ruekert/Mielke, Inc. 2004.

Report on The Electromagnetic Induction Survey for the Detection of Bedrock Fracture Zones for the City of Brookfield, Wisconsin, GeEx, August, 1990.

Results of Geologic Reconnaissance, City of Brookfield, Waukesha County, Wisconsin, Aquifer Science & Technology, a Division of Ruekert/Mielke, November 2002.

Letter to Mr. Ken Ward, Ruekert/Mielke, Inc. dated April 29, 1998 regarding results of Fracture Trace Study for the East Side of Pewaukee (including location of photo-lineaments).

Report on The Phase I study of the Groundwater Exploration Program for the East Half of the City of New Berlin, GeEx, August, 1991.

Report on The Phase II, Dolomite Well Exploration Study at the Westridge and Valley View Park Sites in the East Half of the City of New Berlin, Wisconsin, GeEx, November 1991.



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Ruekert/Mielke, Inc. project files for the following:

Community	Description	Year	R/M Project No.
Brookfield, City	Storm and Ruff Site Geophysics	1999	02-92036
Brookfield, City	Mary Knoll Park Geophysics	2003	02-92054
Brookfield, City	2006 Geophysics	2006	02-92054
Germantown, Village	Shallow Well Exploration	2003	07-92022
Germantown, Village	Well No. 3 Geophysical Logging	2004	07-92024
Mukwonago, Village	Village Wide Geophysical Exploration	1999	12-92071
Mukwonago, Village	Geological Reconnaissance for South Side Wells	2002	12-92110

Data Collation and Analysis

The reports and data referenced above were reviewed for information that relates to the specific characteristics of the dolomite aquifer and its potential use as a future water supply source for the City of Waukesha. While much data exists on a regional basis, only a small portion of the data relate directly to the Waukesha situation. To pare down the data, we reviewed the reports using the following guidelines:

- The reports must identify potential well locations within 5 miles of the future water supply service area.
- The reports must be for the City of Waukesha or areas that border the city.
- The data must be related to the dolomite aquifer and its properties related to fracture trends where high capacity wells could be located.

Based upon regional data, we first developed a map showing the extent and thickness of the Dolomite aquifer in southeastern Wisconsin. That information is provided in **Figure 1**. Previous submittals have indicated that for a dolomite well to be considered for use as a municipal well, certain geologic considerations must be present. First, Wisconsin Administrative Code, ch. NR 811 requires that a welded steel casing that extend a minimum of 60 feet below ground surface be installed and grouted into competent dolomite bedrock. This means that either 60 feet of overburden or glacial drift be present in an area where the dolomite is present or, the dolomite be extensive enough to meet the casing requirements and still maintain an aquifer thickness of at least 100 feet for the production well. This regulatory casing depth requirement and the

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Technical Services Manager
City of Waukesha Water Utility
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need for an aquifer thickness of 100 feet limits the area of the dolomite that can be used for production wells in the vicinity of Waukesha to the areas shown on **Figure 2**.

The location of wells in the area shown on **Figure 2** then becomes a consideration of the aquifer properties of the dolomite relative to the location of fracture zones. We reviewed the referenced reports for the area and developed a figure which shows the results of known fracture trace analyses done in the vicinity. These fracture traces represent the best available indication of potential fracture trends developed by trained hydrogeologists and geoscientists. **Figure 3** combines the information from **Figure 1**, on the extent of the dolomite aquifer, the information from **Figure 2**, on the availability of potential areas where a viable dolomite well site could be located, and the available fracture trace analysis.

We then evaluated the ability of the dolomite aquifer to continue to provide a viable source of water for the region. **Figure 4** shows those locations where known dolomite wells have been constructed in the vicinity for other municipalities. The figure also provides information on the capacity of those wells. This information is then used in developing the opinions on the viability of the dolomite aquifer for use as a future water supply for the city of Waukesha as presented in the next section.

Results of Analyses and Conclusions

All of the data presented on **Figures 1-4** were analyzed to determine the potential for dolomite wells to either serve as the primary source of supply for the City of Waukesha, or as a portion of the supply under scenarios where sources of supply may be combined to reach required demand levels. Based upon our review of the available data, our knowledge of the geology and hydrogeology of the region and the availability of well sites with 5 miles of the City of Waukesha, we conclude the following:

1. The dolomite aquifer is not capable of meeting all of the required demand for the City of Waukesha under current or future demands,
2. We estimate a maximum of between approximately 1,350 to 2,250 gallons per minute could be supplied by wells completed in the dolomite. This is based upon the assumption that permeable fractures exist in the potentially favorable areas, and between three and five new wells could be constructed at an average rate of 450 gpm. Four potential dolomite well locations are shown on **Figures 3 and 4**.



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City of Waukesha Water Utility
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3. Estimates of water available from dolomite well sites are highly dependent on a number of assumptions. These include:
 - a. The potential a (favorable areas) are available for utility use. All the identified potential well sites are located outside City boundaries and may require legal proceeding to acquire, which could take years.
 - b. The favorable areas can be developed as municipal well sites under current code restrictions.
 - c. That between three and five dolomite well sites can be developed.
 - d. Output from each developed well will average 450 gpm.
 - e. Well outputs will not decrease over time or in drought conditions. The Dolomite aquifer is connected to the shallow sand and gravel aquifer and may be influenced by declining water tables during droughts.
 - f. Water quality is acceptable for use as a municipal source of supply.
4. Dolomite wells may be considered as part of a larger, multi-source supply for the City if water quality and mixing concerns, well locations, cost to deliver water to the system, and treatment costs, and politics are acceptable.

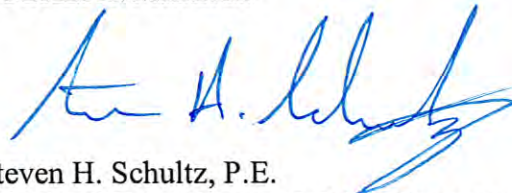
It is important to note that although Brookfield contains a large area where depth to rock exceeds 50 feet and the thickness of the dolomite is greater than 100 feet, in all likelihood the area is not suitable for constructing any additional dolomite wells. Over the last 10 years, AST has worked to locate new well sites (both sand and gravel and dolomite) for Brookfield. The results of these investigations have resulted in one new dolomite well (Well 31 at a capacity of approximately 630 gpm). Three other locations where test borings or wells were constructed resulted in either insufficient capacity or bad water quality (VOC contamination or extremely hard water). It has become apparent that Brookfield has come close to exhausting land, or sites, that are favorable for constructing a new dolomite well. Most all of the available land in Brookfield is either located too close to identified contaminant sources, in wetland or floodplain areas, or does not meet other NR 811 setbacks. These limiting factors will likely also present themselves in other areas adjacent to the City of Waukesha if investigations to locate new dolomite well sites proceed.

Letter to Ms. Nancy A. Quirk, P.E.
Technical Services Manager
City of Waukesha Water Utility
February 28, 2011
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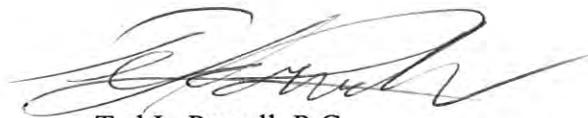
We respectfully submit this data for your use in answer to the DNR inquiries as presented. Please feel free to contact us should you need additional data.

Very truly yours,

RUEKERT/MIELKE



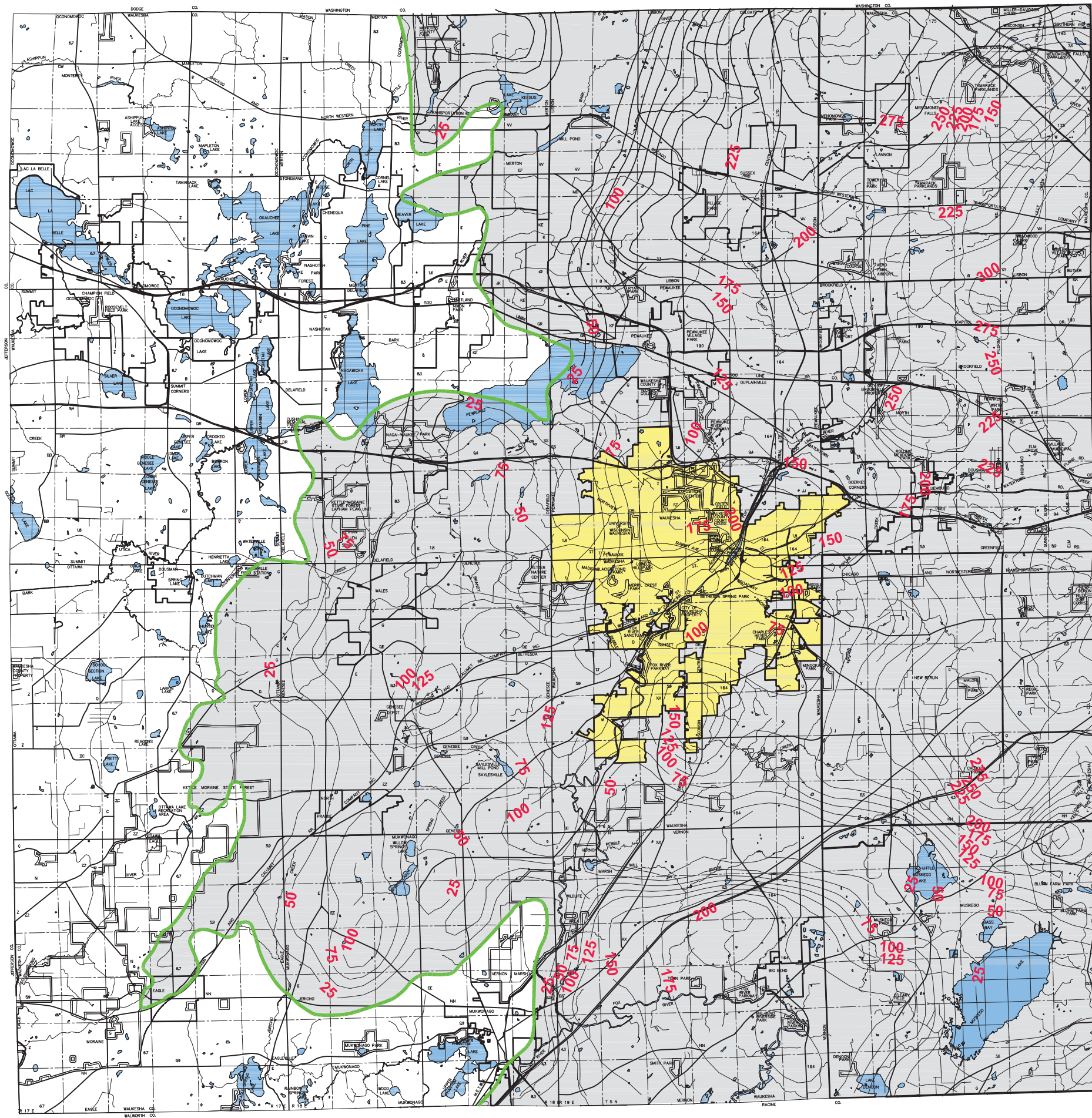
Steven H. Schultz, P.E.
Principal/Water Supply & WTF Department
Head



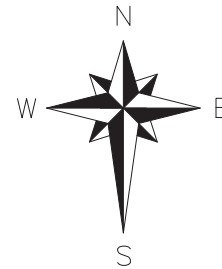
Ted L. Powell, P.G.
Senior Hydrogeologist

SHS/TLP:tag
Enclosures

cc: Daniel R. Butler, P.E., Ruekert/Mielke
File



EXTENT AND THICKNESS OF THE SILURIAN DOLOMITE IN WAUKESHA COUNTY

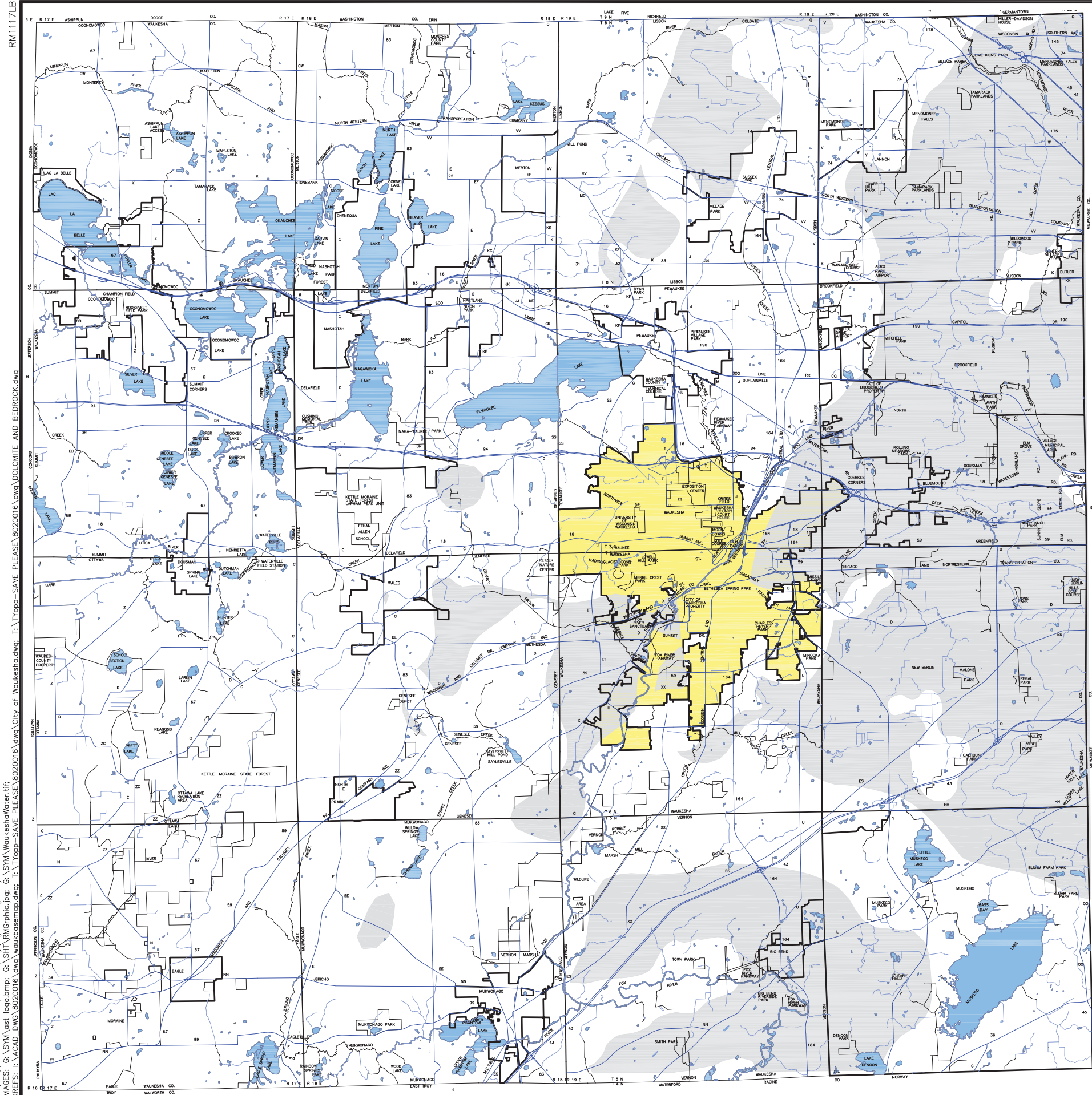


LEGEND

-  **THICKNESS OF DOLOMITE**
-  **APPROXIMATE WESTERN EXTENT OF SILURIAN DOLOMITE**



RM1117LB



SERVING WAUKESHA SINCE 1886

FIGURE 2

DEPTH TO BEDROCK AND DOLOMITE AQUIFER THICKNESS
IN WAUKESHA COUNTY



LEGEND



AREAS WHERE DEPTH TO
BEDROCK EXCEEDS 50' AND
100' OF AVAILABLE DOLOMITE
IS PRESENT



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Feb 03, 2011 4:10pm
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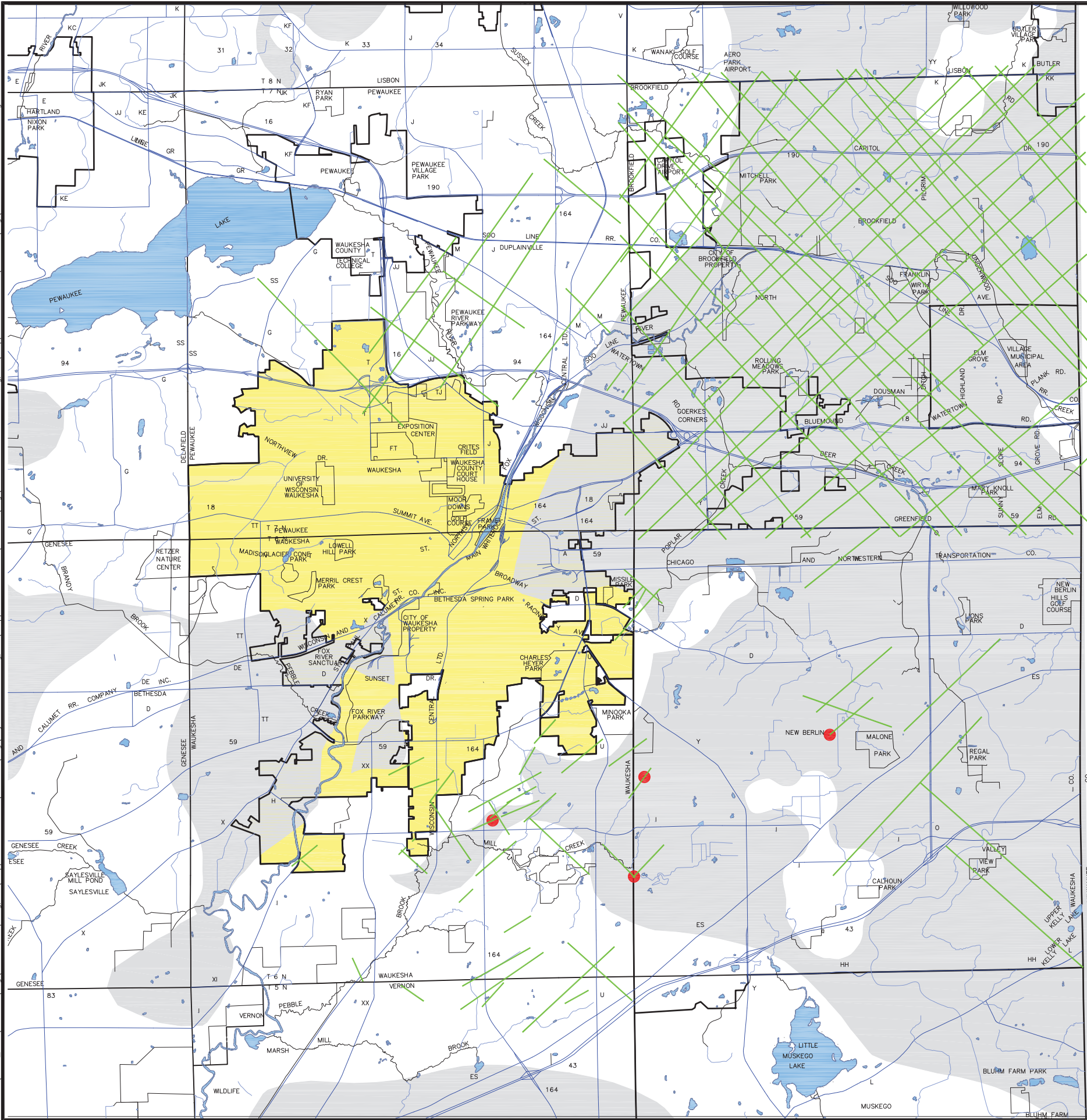
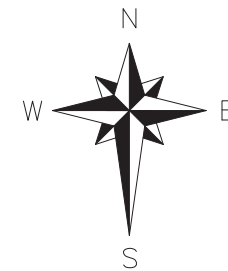





FIGURE 3

AVAILABLE FRACTURE TRACE INFORMATION IN WAUKESHA COUNTY



LEGEND

-  AREAS WHERE DEPTH TO BEDROCK EXCEEDS 50' AND 100' OF AVAILABLE DOLOMITE IS PRESENT
 -  PREVIOUSLY IDENTIFIED FRACTURE TRACES
 -  POTENTIAL DOLOMITE WELL

RM1117LB

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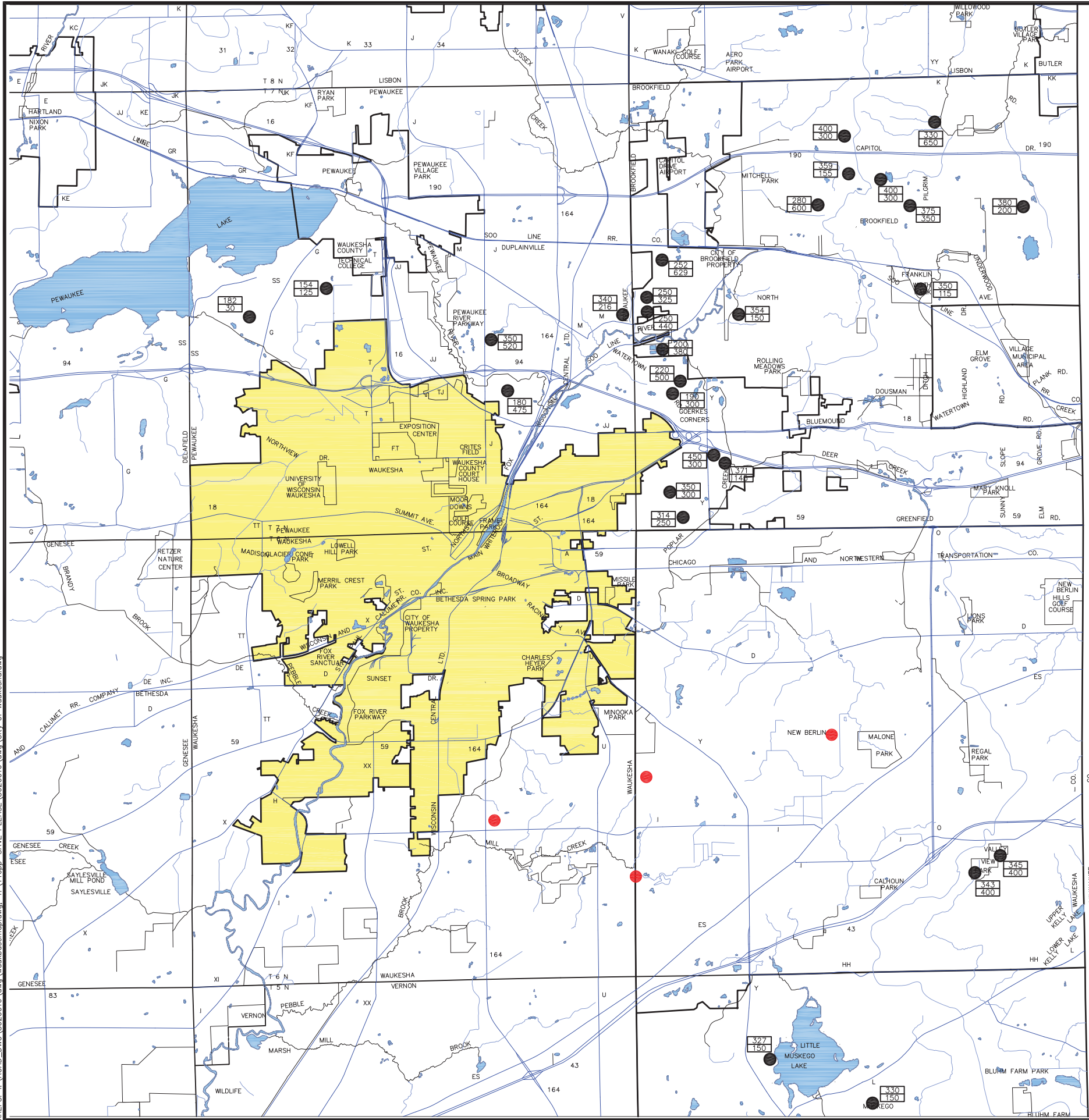


FIGURE 4

KNOWN MUNICIPAL DOLOMITE
WELLS IN THE WAUKESHA AREA



LEGEND

- EXISTING MUNICIPAL DOLOMITE WELL
- ▤ DEPTH (FEET)
APPROX. CAPACITY (GPM)
- POTENTIAL DOLOMITE WELL



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Vernon Marsh Wildlife Area Wetland Habitat Impact Analysis

PREPARED FOR: Waukesha Water Utility

PREPARED BY: CH2M HILL

DATE: March 8, 2011

This memorandum provides an analysis of potential impacts to wetland habitat in the Vernon Marsh Wildlife Area due to withdrawals of groundwater for a City of Waukesha water supply. This memorandum discusses how these anticipated hydrologic changes may affect wetland functions, vegetation, and wildlife and evaluates potential mitigation measures that could lessen impacts to the Vernon Marsh Wildlife Area.

Groundwater Drawdown Effects on Wetland Hydrology

In an unconfined shallow aquifer like that within the Vernon Marsh Wildlife Area, groundwater pumping causes the groundwater levels to drop. When the shallow groundwater reaches (or exceeds) the ground surface, as it does in wetland areas, changes in the wetland's hydrologic system can occur if significant water withdrawal demands are placed on the aquifer. Depending on the duration and extent of the aquifer drawdown, these changes in wetland hydrology can be short or long term, minor or severe.

As described in Appendix N of the Application (Environmental Report Section 2.2.2.1, Water Supply Alternatives), the groundwater model¹ simulates average annual conditions and clearly demonstrates a hydrologic relationship between the regional shallow aquifers and the groundwater level. Therefore, drawdown in the aquifer will influence the ground surface saturation and standing water in wetlands, as well as base flows in Pebble Brook, Pebble Creek, Mill Brook, and the Fox River. Groundwater drawdown and their influence on surface hydrology could be more significant during summer periods, when groundwater levels are naturally lower and municipal water demand is greatest.

The number of wetland acres potentially affected will vary according to the degree of drawdown and the proximity of the wetland to the well's zone of influence. For the purpose of comparing alternatives, the estimated impacts were quantified using a greater-than-1-foot-drawdown extent and a greater-than-5-foot-drawdown extent.

Potential Effects of Hydrologic Change to Wetland Habitat

Processes, functions, and parameters of wetland systems that may be affected by changes in hydrology include vegetative cover, fisheries, benthic macroinvertebrates, soil condition, food chain links/sources, wildlife use, water treatment, water storage, and fire risk.

¹ Appendix O of the Application, *Results of Groundwater Modeling Study: Shallow Groundwater Source – Fox River & Vernon Marsh Area*

For the purpose of estimating and predicting impacts, it was assumed that no surface water would be present in wetlands anytime in the year within the 5-foot *and greater* drawdown contour. This is a reasonable assumption because the shallow aquifer is unconfined and previous modeling demonstrated that there was clear relationship between surface water and ground water resources. Also, it was assumed that no appreciable ground surface saturation would occur at the 5-foot and greater drawdown. Therefore total wetland loss within areas of 5-foot or greater drawdown (as predicted by the groundwater model) would occur.

The U.S. Army Corps of Engineers (USACE) in their *Manual for Wetland Delineations* and the *Interim Regional Supplement to the Corps of Engineers Wetland Delineation Manual: Midwest Region* generally defines wetlands as having soil saturation starting at a depth of 1 foot or less during the growing season (USACE 1987, 2010). Consequently, a groundwater drawdown of 1 foot or more would have impacts upon wetland hydrology. A groundwater drawdown of less than 1 foot would not have the degree of negative impacts to wetland hydrology associated with greater drawdowns if the surface soil is saturated. For wetland impact analysis purposes, it has been conservatively assumed that a 1-foot annual average drawdown *or less* will have no appreciable loss of wetland function. This is reasoned because it is possible that significant rainfall events could temporarily replenish groundwater levels to pre-drawdown conditions. If this happens in the growing season, the wetland could show less appreciable negative impact. If replenishment happens regularly, the wetland may retain many of its functions and characteristics.

It follows that the area *between* the 1-foot drawdown and the 5-foot drawdown represents a potential gradient for changing from one wetland type to another. Where deep-water wetlands currently exist, such as open water and aquatic bed habitats, a 2-, 3-, or 4-foot drawdown would shift the wetland vegetation to a more shallow emergent marsh or wet meadow. This would not be a total loss of wetland, but it would be a change in wetland type, and cause negative impacts to natural communities. However, where an existing shallow or ephemeral wetland occurs (such as emergent or wet meadow, seeps, forested wetland), a small decrease in surface water level or prolonged dry periods may result in lost wetland functions and a gradual shift toward an upland community.

Wetland types and water resources present in the geographic area of the Vernon Marsh Wildlife Area include:

- Calcareous fen
- Emergent or wet meadow
- Filled or drained wetland
- Flats or unvegetated wet soil
- Forested swamp
- Fox River
- Groundwater seeps
- Open water and aquatic bed
- Scrub shrub

The wetland types and the effects of groundwater drawdown on the habitat they provide are described below.

Calcareous Fen

Calcareous fen is a rare wet meadow type that is sustained by natural springs or groundwater seeps that make it to the surface. These springs and seeps bring specific water chemistry and hydrologic conditions that sustain some rare and specialized plant species

(WDNR, 2006). The groundwater that reaches the surface is rich with calcium and magnesium bicarbonates (or sulfates), which creates a strong alkaline soil condition, in which only a few, rare calcium-tolerant plants can thrive (Miner and Ketterling, 2003). Prolonged interruption of this hydrologic process sustained by consistent groundwater expression may result in loss of these certain rare resources. Calcareous fen occurs in the southern end of the Vernon Marsh Wildlife Area, in an area not included in the model's predicted area of drawdown. Consequently, no known calcareous fens will be impacted by the drawdown. However, plant species that require calcareous fen habitat or similar conditions were retained in the threatened and endangered species evaluation for the groundwater alternatives that have the potential to affect the Vernon Marsh Wildlife Area, since similar groundwater seepage conditions, even though they might not be a calcareous fen, could exist in the groundwater drawdown influence area. Additional information on the impacts the shallow groundwater water supply alternatives may have on unique species is found in the response to the WDNR question RF18 from December 2, 2010.

Shallow Wetlands

Shallow wetland types, such as the emergent or wet meadow, flats or unvegetated wet soil, forested swamps or alluvium, seeps, and scrub shrub are wet only part of the year, as these wetland types have short and shallow hydroperiods. A prolonged or permanent decrease in groundwater levels of 1 foot or greater could lower the surface water level and soil saturation within these wetland types to such a degree that detrimental impacts to wildlife, endangered resources, and vegetative cover may occur. impacts might include loss of habitat for invertebrates, fish, amphibians, or wading birds. Other impacts might be seen as a change in wildlife species that use the wetland, that is, with fewer wetland-dependent species present, more terrestrial species move in. Changes in herbaceous groundcover species would be observed first, followed by growth of a shrub layer.

Changes in groundcover could include a shift toward upland species, and upland shrubs could invade, resulting in a shift from herbaceous wetland to herbaceous/shrubby upland. In many stressed wetlands, invasive plants become established and out-compete native vegetation. Invasive exotics can include reed canary grass (*Phalaris arundinacea*), giant reed (*Phragmites communis*), and purple loosestrife (*Lythrum salicaria*).

A permanent loss of surface water would most certainly preclude fish habitat and amphibian habitat, which likely would degrade the potential for the wetland to support other wildlife that feed on fish or amphibians.

Forested Wetlands

Wetland trees have a morphological adaptation to survive in wet soil conditions. When wet soils are exposed to air for several years, the result can be a loss of hydric indicators in the soil through oxidation, and subsidence can occur. The tree subcanopy and canopy would show signs of stress, the soil can subside, and trees topple as a result of reduced soil strength. With the loss of trees, the habitat is less suitable for nesting and denning, and food sources change (different plant seeds/berries), which may result in a loss of habitat for mammals, birds, or reptiles.

Drained or Filled Wetlands

Previously impacted (drained or filled) wetlands are likely to have diminished wetland functions and characteristics. Further and prolonged reductions in surface hydrology would in most situations result in complete loss of remaining functions.

Open Water Wetlands

Open water and aquatic bed wetland systems, which have much deeper water and are typically a permanent year-round flooded wetland type, can retain many of the functions associated with wetlands depending on the severity with which the hydrology has been affected. Aquatic beds along open-water areas could adapt to lowered water levels by extending runners and rhizomes farther into the deeper water zones as they drain or by a change in vegetation composition, where more drought-tolerant wetland plants become established. Within the predicted 1-to-5-foot drawdown range, the deeper systems might lose some deep-water wetland characteristics, such as waterfowl habitat, but may transition to a wet meadow or marsh habitat, which is more suitable to wading birds.

Summary of Potential Wetland Impacts

As stated previously, the degree of impacts observed in any given wetland will vary depending on wetland type, proximity to the zone of drawdown, the severity of depressed water table, frequency and amount of rainfall, etc. Also, impacts will vary from one extreme, such as a total loss of all wetland functions, to a shift from one wetland type to another.

The estimated areas (acreage) of impact that may occur between the 1-foot drawdown and the 5-foot drawdown under the Deep and Shallow Aquifer Mix scenario and under the Shallow Aquifer and Fox River Alluvium scenario are presented in Table 1. As previously stated, for analysis purposes, a groundwater drawdown of less than 1 foot has been assumed to have no appreciable loss of wetland function. Groundwater drawdown less than 1-foot could also impact wetland hydrology and function depending upon the existing groundwater level relative to the ground surface. This analysis however focuses in on the 1-foot or greater groundwater drawdown depths which would be expected to have the most significant impact to wetland hydrology.

TABLE 1
Area of Wetland Types Drawdown between 1 and 5 Feet

	Acres within Drawdown Area	
	Deep and Shallow Aquifer Mix	Shallow Aquifer and Fox River Alluvium
Emergent or wet meadow	469.6	604.2
Filled or drained wetland	9.5	10.2
Flats or unvegetated wet soil	38.4	44.1
Forested	624.7	730.8
Open water and aquatic bed	77.5	66.4
Scrub/ shrub	875.4	686.9
Total	2,095.10	2,142.60

The estimated areas of impact that may occur at the 5-foot drawdown and greater under the Deep and Shallow Aquifer Mix scenario and under the Shallow Aquifer and Fox River Alluvium scenario are presented in Table 2.

Potential Mitigation Action Analysis

Based upon the groundwater modeling results, there will be impacts to wetlands from groundwater drawdown for the shallow groundwater supply alternatives, and not all of these impacts can be offset or reduced to insignificant levels. Consequently, activities or actions that could partially minimize, restore, reduce, or reverse the adverse affects of groundwater drawdown include:

- Flow augmentation with groundwater
- Control of surface water outfall
- Well field pump rotation
- Mitigation bank credit purchase

The first three of the four potential mitigation methods listed below could be targeted to reduce impacts on selected wetlands if particularly rare or locally important resources were threatened.

Augmentation with Groundwater

Augmentation with groundwater could be used as a water supplement to, in part, offset the loss of groundwater seepage to the wetland resulting from the groundwater drawdown. Under this mitigation measure, groundwater would be withdrawn from a local source, such as a groundwater well, and piped to a wetland area for surface discharge during certain critical times of the growing season. This approach has been used in Florida to reduce adverse effects and to avoid predicted adverse effects on wellfields (SJRWMD, 2009).

Potential disadvantages of this approach include that additional groundwater pumping will cause additional groundwater drawdown and consequently affect more wetlands. This is contrary to the goal of reducing the acreage of wetlands impacted by groundwater drawdown. The applicability of wetland flow augmentation from groundwater also faces limitations of location and topography.

Augmentation with groundwater is most applicable to certain wetland areas that are hydrologically isolated from other wetlands, have relatively flat topography, and are within manageable proximity to a groundwater source. These characteristics allow the flow augmentation to be distributed across the wetland in close to a uniform manner allowing ground saturation to occur over as broad of an area as possible. Also, plant species adapted to niche habitat conditions, for example, groundwater seeps (which are prevalent at the Vernon Marsh Wildlife Area), would be less likely to benefit unless the augmentation input was designed to recharge local groundwater in a specific area. Delivering water to the wetland requires active operational management and regular monitoring. Because of these

TABLE 2
Area of Wetland Types Drawdown 5 Feet and Greater

	Acres within Drawdown Area	
	Deep and Shallow Aquifer Mix	Shallow Aquifer and Fox River Alluvium
Emergent or wet meadow	240.6	475
Filled or drained wetland	1.8	2.4
Flats or unvegetated wet soil	12.1	30.4
Forested	307.5	547.9
Open water & aquatic bed	11.1	37
Scrub/ shrub	419	871.3
Total	992.1	1,964.00

limitations the applicability of this mitigation alternative is limited to small targeted areas, which makes application impractical to address all impacts.

Control of Surface Water

This strategy is intended to reverse hydrologic changes brought about by ditching and draining a wetland's surface water. Wetlands that have been previously altered through ditching can be further impacted by groundwater drawdown. This approach calls for a control structure to be constructed in an outfall ditch draining a part of the wetland, with the top of the weir set to match the wetland's seasonal high-water level, thereby allowing rainfall and groundwater to accumulate in the wetland. The goal of backing up the water is to restore the saturated conditions in the surface soils. This in-stream dam is designed to back up and divert outflows up to a certain level, but in doing so would raise flooding levels on streams by backing up water. Consequently, the control structures can themselves have unintended effects upstream and downstream including changing the hydrology of downstream aquatic resources, causing upstream surface flooding, potentially causing less downstream soil saturation, and creating barriers to aquatic species. As a result, it will not be practical in many circumstances, including the use of it on the Fox River and main Fox River tributaries.

Control structures could be used in wetlands where flowing surface water is available and could be used to hold back the flow and allow some flow augmentation in the wetland. Benefits to some wetlands may be achieved with the construction of small dams or ditch blocks (within the Vernon Marsh Wildlife Area Property boundary) to hold back base flow, which could recharge, or flood, wetland areas in the Vernon Marsh Wildlife Area. If base flow in a ditch were held back in certain locations, the water level might recharge enough to benefit nearby wetlands. Wetlands near the structure would benefit the most; conversely, wetlands farther away would benefit less.

The benefits realized from a surface water control structure are limited by regional weather conditions; in times of drought the structure would have no effect because the measure is rainfall dependent and a base-flow control weir will have no beneficial effect if there is no surface water outflow from the wetland. Targeting specific resources, for example, plant species adapted to niche habitat conditions (groundwater seeps), would be difficult. The applicability of this mitigation alternative is consequently limited seasonally and to specific locations and topography, and it is not practicable for large areas with diverse habitat types, such as those affected by the groundwater drawdown, and is better suited for wetlands that have been previously altered through ditching. This mitigation alternative is impractical to address all impacts.

Well Field Pump Rotation

A potential mitigation option could be to increase the number of wells to spread the groundwater drawdown impact over a larger area and implement a pump operation rotation schedule. Depending on the zone of influence that each well would have on the local groundwater, an "on-off" pumping schedule might provide the supply water needed and still give temporary relief, or a "rest period," of groundwater drawdown to certain areas. The strategy calls for strategic wells to be shut off for a period of time, thereby allowing the groundwater to rebound. The intent is for the groundwater to recharge enough to reach the ground surface in the wetland. This rest period for the wetland may be enough

for wetlands experiencing slight groundwater drawdown to retain functions, support desirable vegetation, and support wetland dependant wildlife.

Where specific wetlands have been identified as providing significant habitat to threatened or endangered species, or if the wetland type (e.g., wet meadow, calcareous fen) is particularly vulnerable to prolonged drawdown, pumping rotation may result in successful minimization of impacts.

Potential limitations of this approach are varied. The 1-foot or greater drawdown area already affects over 2,000 wetland acres; consequently, expanding the drawdown area would impact even more wetland acres. In addition to potential environmental impacts, such a mitigation option would require active operational management, additional pipelines, wells, and property acquisition, all of which would add significant cost to the alternative. This approach would be less practical to implement by requiring more property owners to sell land for well sites. As a result, the applicability of this mitigation alternative may be undesirable due to implementation difficulties and additional cost. Further, this mitigation alternative is impractical to address all impacts.

Wetland Mitigation Bank Credit Purchase

Another mitigation option is to purchase wetland credits from a wetland mitigation bank. Purchasing wetland mitigation bank credits is not preferential, however when the wetland purchase transfers wetland resources out of the source watershed. According to the multi-agency publication *Guidelines for Wetland Compensation Mitigation in Wisconsin* (WDNR et al., 2002) onsite mitigation is preferable when practicable and if site conditions are acceptable. The preference stated in the guidelines is to keep mitigation within the “same sub-watershed or one-half mile of the wetland impact.” The goal of these preferences is to replace lost wetland acreage nearest the impact area as possible. For impacts to wetlands in the Vernon Marsh Wildlife Area, mitigation beyond the preferred mitigation distance would have to be considered.

At this time, the State of Wisconsin does not have an in-lieu-fee wetland credit purchase program (ELI, 2011a). However, wetland mitigation credits can be purchased from a permitted mitigation bank subject to coordination and approval from the U.S. Army Corps of Engineers. Upon final approval, some of the project’s impacts could be offset through purchase of credits from mitigation banks. One criterion for approval is location of the impact relative to the bank’s permitted service area. In Wisconsin, there is only one available commercial mitigation bank with credits remaining, located in Wood County near Wisconsin Rapids (WDNR, 2008). The wetland mitigation bank in Wood County has only 65 credits remaining (O’Leary, 2011).

Potential limitations of this approach include an insufficient number of credits available at the approved bank to offset wetland impacts to the Vernon Marsh Wildlife Area and the wetland resources being transferred over 100 miles to a different watershed. As a result, the applicability of this mitigation alternative is inadequate to compensate for predicted impacts at the Vernon Marsh Wildlife Area.

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Attachment WS10

Multiple Source Water Supply Evaluation

Multiple Source Water Supply Evaluation

TO: Waukesha Water Utility

FROM: CH2M HILL

DATE: April 13, 2011

This memorandum responds to question WS10 from the Wisconsin DNR's letter of December 2, 2010, on the City of Waukesha's Application for Lake Michigan Water Supply.

Comment WS10

With respect to the technical and cost-effectiveness evaluation of the multiple water source alternative described in the Draft Technical Memorandum, "Review of Water Supply Alternatives", attached to the letter from the City of Waukesha dated July 27, 2010, additional information will need to be provided to the department. How were the percentages of water supply from each water source determined? Has a maximum sustainable pumping rate been determined for each water source alternative in relation to minimal environmental impacts? While the Draft Technical Memorandum states that the total cost of the Multiple Water Supply Alternative uses the same criteria as the Application, there is no specific cost associated with each multiple water source presented in the memorandum. Please identify the costs associated with each water source that combine to make up the total cost represented in Table 1 of the Technical Memorandum. Are there other combinations of water sources that can be considered as part of a multiple water source alternatives analysis (e.g., different pumping rates of water sources or other sources not included in the alternative, such as the Silurian dolomite aquifer or river bank inducement)?

Response to Comment WS10

A multiple source water supply alternative was developed based on the available water resources in the area. The six water supplies in this multiple source alternative include:

- Existing deep aquifer wells in the City of Waukesha
- Existing shallow aquifer wells outside the City of Waukesha limits to the south
- New wells in the Fox River alluvium (riverbank inducement wells) outside the City of Waukesha limits to the south
- Quarries north of the City of Waukesha
- New wells in the unconfined deep aquifer west of the City of Waukesha
- New wells in the Silurian dolomite aquifer outside the City of Waukesha limits to the Southeast

Groundwater modeling was conducted to determine environmental impacts over a range of pumping rates.

This alternative was evaluated consistently with the other water supply alternatives in the Application for Lake Michigan Supply. The same four evaluation criteria used for the other water supply alternatives were used; Environmental Impacts, Public Health, Long-term Sustainability, Implementability (see Exhibit 1 in Attachment WS7 for more details).

Groundwater modeling from RJN Environmental Services¹ was used to estimate reasonable yields from various sources based on environmental impacts for the deep confined aquifer, unconfined deep aquifer, shallow aquifer and Fox River alluvium (riverbank inducement).

Costs from each water source are included at the end of the analysis presented below. The unit cost of supplying water (\$/1,000 gallons) from each of the six water supply sources is higher than a Lake Michigan alternative. Therefore, no combination of these sources will be less expensive than the Lake Michigan alternative. The conclusion is that this alternative has more adverse environmental impacts, is less protective of public health, and is more expensive than the Lake Michigan alternative. Therefore, it is not a reasonable water supply alternative (see Legal Exhibit B).

Multiple Water Supply Sources

A brief description of each water supply source is presented below.

Deep Aquifer

This water supply source is described in the Application for Lake Michigan Water Supply (Alternative 1). It consists of existing deep wells (Nos. 3, 6, 8, and 10) in the City of Waukesha. The wells would be piped to a blending reservoir (Hillcrest Reservoir) to reduce radium, provide consistent water quality to residents and protect the distribution system from corrosion and other problems from mixing different water qualities (Exhibit 1). The capacity during average day water demand would be about 2 mgd, and about 4 mgd during maximum day demand. The 2 mgd average capacity was selected because it will reduce reversing the flow of groundwater out of the Lake Michigan basin as discussed below, and increase the aquifer's potentiometric surface slightly (about 50 feet).

Quarry

Potential surface water supplies north of the City of Waukesha include two active stone quarries in the town of Pewaukee WI, and two quarries in the town of Lisbon, WI. The Pewaukee quarries pump about 1 to 3 million gallons per day (mgd) and the Lisbon quarries about 3 to 6 mgd for dewatering based on 2002 to 2010 data from WDNR. All these quarries are active and not planned for drinking water supply. There are no quarries in Wisconsin used for drinking water supply, so the ability to use these quarries for water supply is questionable. However, for the purposes of this evaluation it was assumed that Waukesha could access some of the water from these quarries for drinking water supply. Average day sustainable water supply was assumed to be 2.5 mgd, and about 5 mgd during maximum day demands. Less water would be available from all quarries during a drought since some of the water comes from rainfall and the rest depends on groundwater storage and recharge which is affected by drought.

¹ RJN Environmental Services, LLC. February, 2011. Summary of Groundwater Modeling . Reviewed by Dr. Kenneth R. Bradbury – Wisconsin Geological and Natural History Survey.

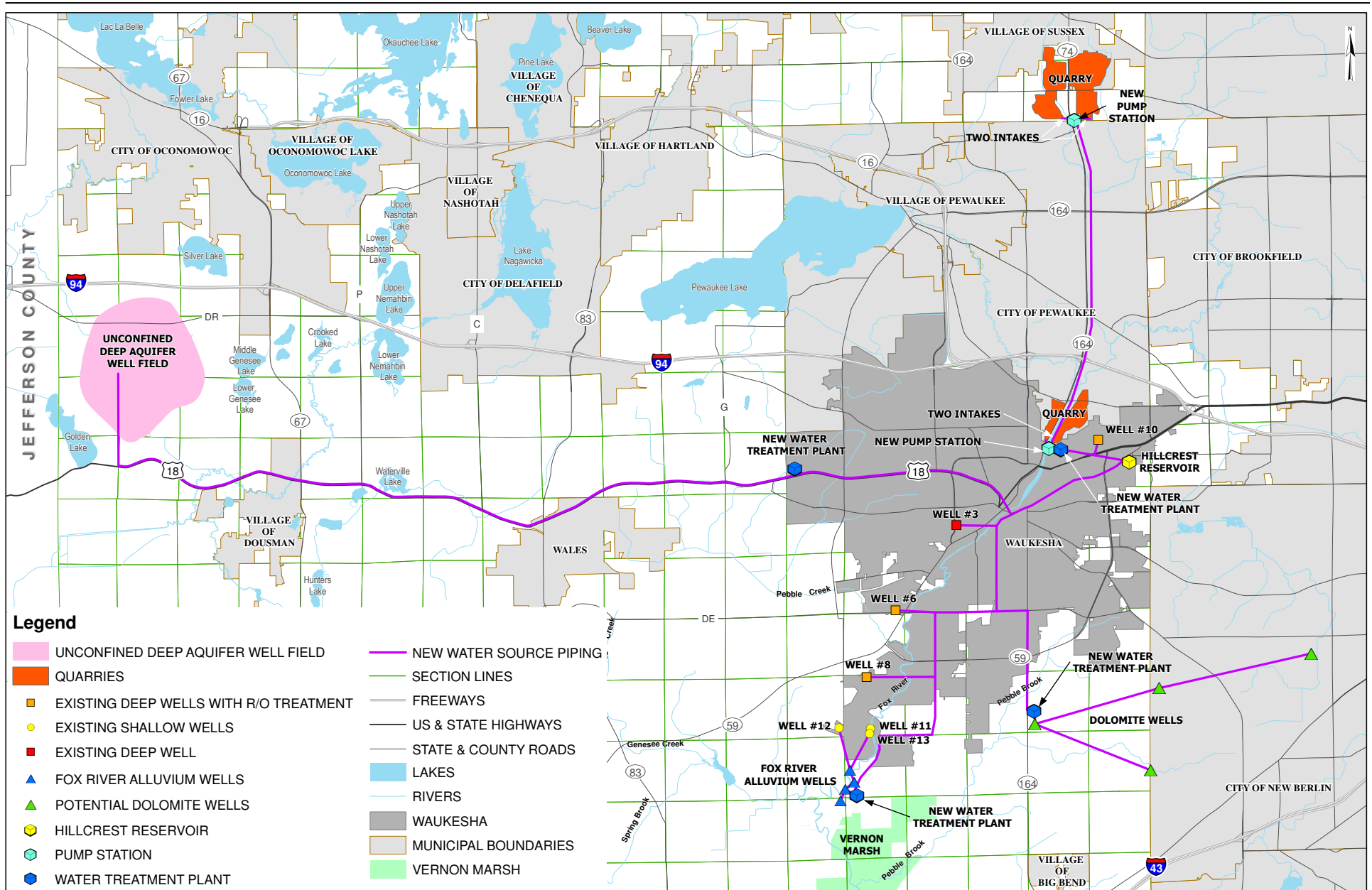
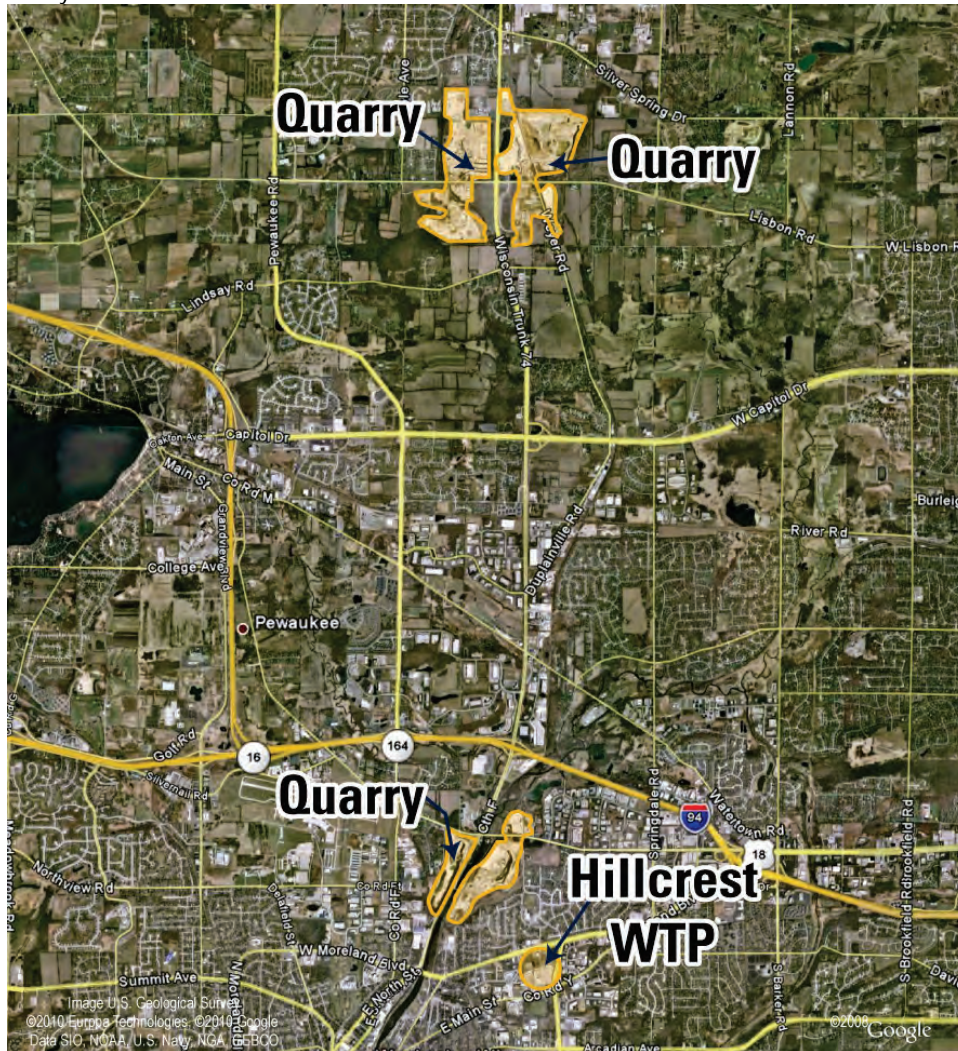


EXHIBIT 1
Multiple Water Supply Facilities

Quarry water would be obtained through an intake structure in each quarry, two pump stations delivering water near the Hillcrest reservoir in Waukesha where it would be treated as surface water (Exhibit 1). Exhibit 2 shows the general location of the quarries.

EXHIBIT 2
Quarry Locations



Shallow Aquifer and Riverbank Inducement

This water source is described in the Application for Lake Michigan Water Supply (Alternative 2). An average of 1 mgd would be pumped from existing shallow wells 11, 12 and 13, and another 1.5 mgd pumped from five new riverbank inducement wells in the Fox River alluvium. Existing wells 11 and 12 are considered riverbank inducement wells due to their close proximity to the Fox river. A 2.5-mgd average capacity was chosen because it uses existing facilities (wells 11 to 13), and groundwater modeling indicated that this pumping rate reduces the environmental impact compared to pumping higher capacities from this aquifer, as discussed later.

The water would be pumped to a water treatment plant, treated and pumped to the Hillcrest Reservoir for blending. Facilities are shown in Exhibit 1.

Unconfined Deep Aquifer

This water source is described in Attachment WS7. An average of 3 mgd would be pumped from the unconfined deep aquifer west of Waukesha. This capacity was chosen because groundwater modeling indicated reduced environmental impact compared to pumping higher capacities from this aquifer, as discussed later. The water would be pumped from 5 wells with a maximum capacity of about 1.5 mgd each, through a pipeline, treated to remove iron and manganese, then pumped to the Hillcrest Reservoir for blending (Exhibit 1).

Silurian Dolomite Aquifer

The Silurian dolomite aquifer occurs to the northeast and southeast of Waukesha. It is made up of dense, hard dolomite bedrock but has fractures that can contain and transport water. Productive wells in the aquifer are difficult to locate. A recent report estimated that a typical well could produce 0.4 to 1 mgd if properly located and developed² (see Attachment WS8). This report also estimated that up to 2 to 3 mgd of water could be obtained from this aquifer, if a number of assumptions were met. This may not be possible given the assumptions in the report. However, for the purposes of this alternative, it was assumed that Waukesha could locate four wells with capacities of 0.5 mgd each. The average day demand would be 1 mgd and maximum day demand 2 mgd. The water would be pumped to a water treatment plant for iron and manganese removal, then pumped to the Hillcrest reservoir for blending. Facilities are shown in Exhibit 1.

An evaluation of each water supply source in the multiple source alternative, based on the four criteria, follows.

Environmental Impacts

Deep Aquifer

Reducing pumpage from the deep aquifer lessens the adverse environmental impact of the current pumping rate. Modeling indicates that if Waukesha reduces deep aquifer pumping to about 2 mgd, reversing the flow of groundwater away from the Lake Michigan basin is significantly reduced (Exhibit 3).³ However, pumping water from the deep aquifer still reduces the amount of water that would flow to the waters of the Lake Michigan Basin if no pumping occurred.⁴ In addition, deep wells in other communities would still extract water that would otherwise flow to the Lake Michigan basin.

Reducing deep confined aquifer pumping to 2 mgd could create a rebound in the deep aquifer water level of about 50 ft near Waukesha.⁵ However, water levels would still be well in excess of the 150 ft of drawdown for a groundwater management area (see Legal Exhibit D for more information on Groundwater Management Areas). Pumping water from the unconfined deep aquifer (another water source in this alternative) would reduce

² Ruekert & Mielke, letter report on the Silurian dolomite aquifer, February 28, 2011.

³ RJN Environmental Services, LLC. February, 2011. Summary of Groundwater Modeling Study. Reviewed by Dr. Kenneth R. Bradbury – Wisconsin Geological and Natural History Survey.

⁴ D.T. Feinstein, USGS. October 2006. *Where do the deep wells in southeastern Wisconsin get their water?*
<http://wi.water.usgs.gov/glpf/index.html>

⁵ RJN Environmental Services, LLC. February, 2011. Summary of Groundwater Modeling Study. Reviewed by Dr. Kenneth R. Bradbury – Wisconsin Geological and Natural History Survey.

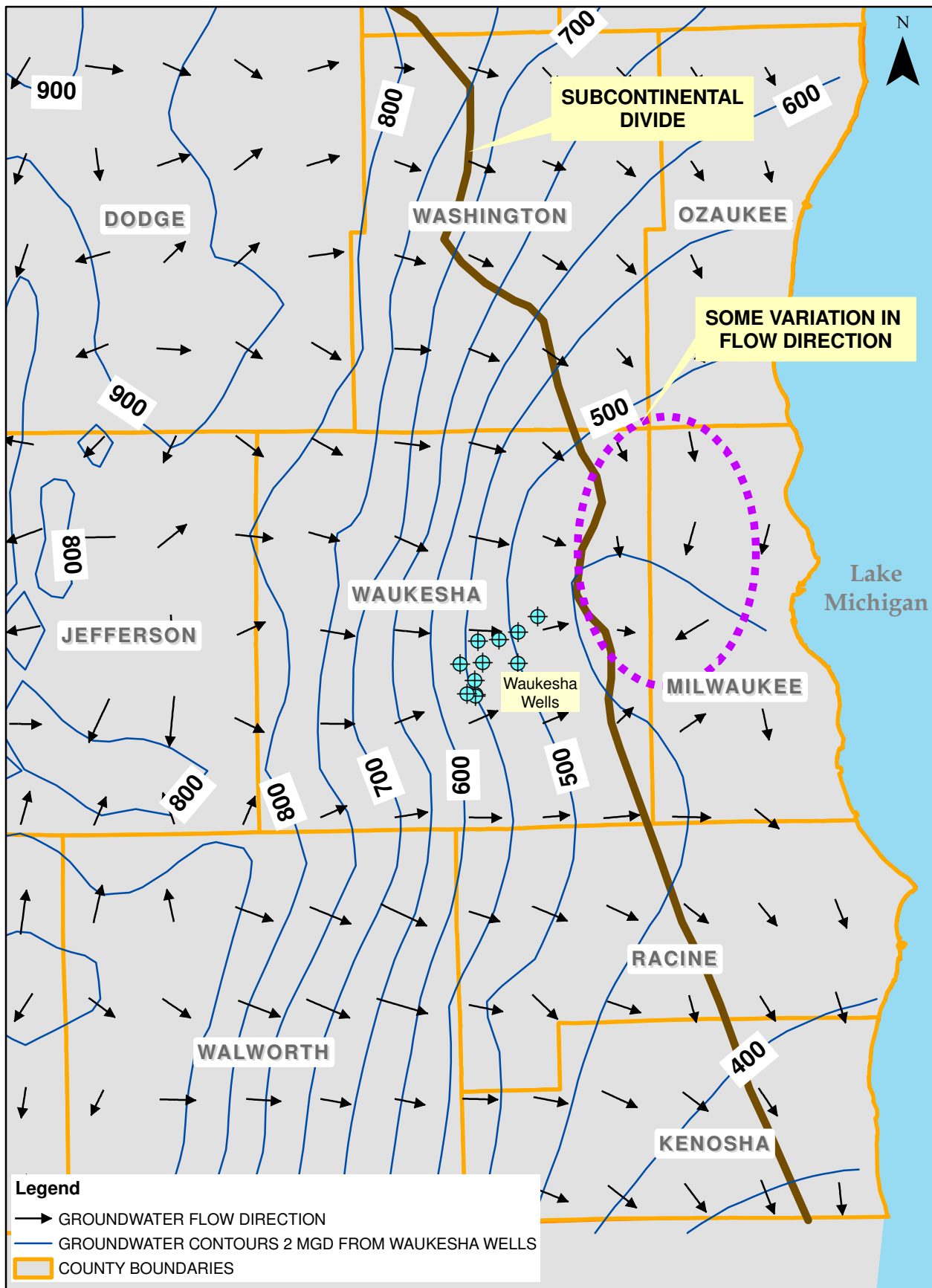


EXHIBIT 3
Groundwater Flow Direction - Waukesha Wells at 2 mgd

this rebound since the deep unconfined aquifer is in the recharge zone of the confined deep aquifer.

Water pumped from the deep aquifer removes water that would otherwise be available to local surface water resources. The USGS and WGNHS indicate that 70 percent of water pumped from the deep aquifer would have gone to inland surface waters. The remaining 30 percent originates from inside the Lake Michigan Basin and 4 percent of that is contributed by Lake Michigan.⁶ Reducing natural flows to surface waters by pumping the deep aquifer has adverse environmental impacts both inside and outside the Lake Michigan Basin. However, these impacts are reduced at lower pumping rates.

Shallow Aquifer and Riverbank Inducement

Pumping the shallow aquifer and Fox River alluvium (riverbank inducement) can cause adverse environmental impacts on ground and surface water resources. Pumping lesser quantities of water will reduce the environmental impacts. The Troy Bedrock Valley groundwater model⁷ was used to simulate shallow aquifer (1 well) and riverbank inducement (7 wells) groundwater drawdown and baseflow reduction with these eight wells pumping a total of 2.7 mgd (Attachment WS7A). Note that this is an average day demand value. About twice that amount would be needed during a maximum day or during a drought, increasing the environmental impacts significantly. Modeling results indicated groundwater drawdowns of 20 to 30 feet near the wells (Exhibit 4).⁸ A groundwater drawdown of 1 foot is significant in a wetland as it may affect root structures of aquatic plants. Exhibit 4 shows the area affected by a 1-foot drawdown. The area is less than that from pumping the entire Waukesha water supply from this aquifer, as described in Alternative 2 of the Application for Lake Michigan Water Supply. Note that water pumped from the Silurian dolomite was not included in the groundwater modeling runs and could increase drawdown if pumped at the same time.

Water extracted from the ground reduces the water that would flow naturally to wetlands, lakes and streams (base flow). The model estimated that base flow would be reduced, as shown below with this alternative.⁹ This baseflow reduction is in the area of well influence, and can have adverse environmental impacts to the water ecosystems. However, the adverse impact is less than pumping the entire Waukesha water supply from this aquifer. Another study estimated significant baseflow reductions would occur near Waukesha when 3.9 mgd of shallow groundwater was pumped and artificial recharge was used¹⁰

Under this scenario, water also would be drawn from the Fox River through the riverbank wells. After use the water would be discharged back to the Fox River from the wastewater treatment plant upstream of the withdrawal location to reduce impacts on Fox River baseflow.

⁶ D.T. Feinstein, USGS. October 2006. *Where do the deep wells in southeastern Wisconsin get their water?*
<http://wi.water.usgs.gov/glpf/index.html>

⁷ Troy Bedrock Valley Aquifer Model. Memorandum Report Number 188. Prepared by Ruekert & Mielke for SEWRPC. Reviewed by Dr. Kenneth R. Bradbury – Wisconsin Geological and Natural History Survey. January 2010.

⁸ RJN Environmental Services, LLC. February, 2011. Summary of Groundwater Modeling Study. Reviewed by Dr. Kenneth R. Bradbury – Wisconsin Geological and Natural History Survey.

⁹ RJN Environmental Services, LLC. February, 2011. Summary of Groundwater Modeling Study. Reviewed by Dr. Kenneth R. Bradbury – Wisconsin Geological and Natural History Survey.

¹⁰ Preliminary Draft, Technical Report Number 46, Groundwater Budget Indices and their use in Assessing Water Supply Plans for Southeast Wisconsin. Douglas S. Cherkauer, Department of Geosciences, University of Wisconsin–Milwaukee. September 2009.

Water transmission mains extending from the shallow aquifer wellfield to the treatment plant, and from the treatment plant to Waukesha, would have environmental impacts during construction. Appendix N of the Application contains additional information on environmental impacts.

Resource	Baseflow Reduction (%) from Pumping Shallow Wells for a Total of 2.7 mgd
Fox River	94
Pebble Brook	19
Vernon Marsh	37
Mill Brook	55

Unconfined Deep Aquifer

Pumping 2 to 15 mgd from the unconfined deep aquifer was modeled using the SEWRPC model.¹¹ Modeling results indicated deep sandstone aquifer drawdowns up to 46 feet near the wells, and shallow aquifer drawdowns around 0.3 foot at 2 mgd. Baseflow reductions ranged from 1 percent to 5 percent in most surface water sources, but 34 percent in the Bark River at 2 mgd. The results on groundwater drawdown at 2 mgd are shown in Exhibit 5 for the unconfined deep aquifer and in Exhibit 6 for the shallow aquifer located above the unconfined deep aquifer.¹²

Water extracted from the ground reduces the water that would flow naturally to wetlands, lakes, and streams (base flow). The adverse environmental impacts are less than those from pumping the entire Waukesha flow from this aquifer. (See Attachment WS7.)

A portion of the water pumped from the unconfined deep aquifer is induced from surface waters. This water is transferred from the Rock River watershed to the Fox River watershed when discharged from the Waukesha wastewater treatment plant.

Water transmission mains in the unconfined deep aquifer wellfield and extending to Waukesha would have environmental impacts during construction. Environmental impacts of the pipeline are similar whether a large or small pipe is installed.

Quarry

The quarries currently collect rain water, surface water runoff and groundwater seeping into the quarry and pump it to the Fox River. Using this water for public drinking water supply would not significantly increase the current environmental impact based on groundwater drawdown and impact on wetlands. Baseflow in the Fox River would be reduced slightly between the quarries and the wastewater plant since the water would be discharged downstream of the quarries.

Silurian Dolomite Aquifer

Withdrawing water from the dolomite aquifer induces more recharge from the shallow aquifer and reduces the amount of water that may have been available to surface waters. Since this alternative is withdrawing a relatively small amount of groundwater over a large area, the impact on the environment is reduced.

¹¹ RJN Environmental Services, LLC. February, 2011. Summary of Groundwater Modeling Study. Reviewed by Dr. Kenneth R. Bradbury – Wisconsin Geological and Natural History Survey.

¹² Ibid.

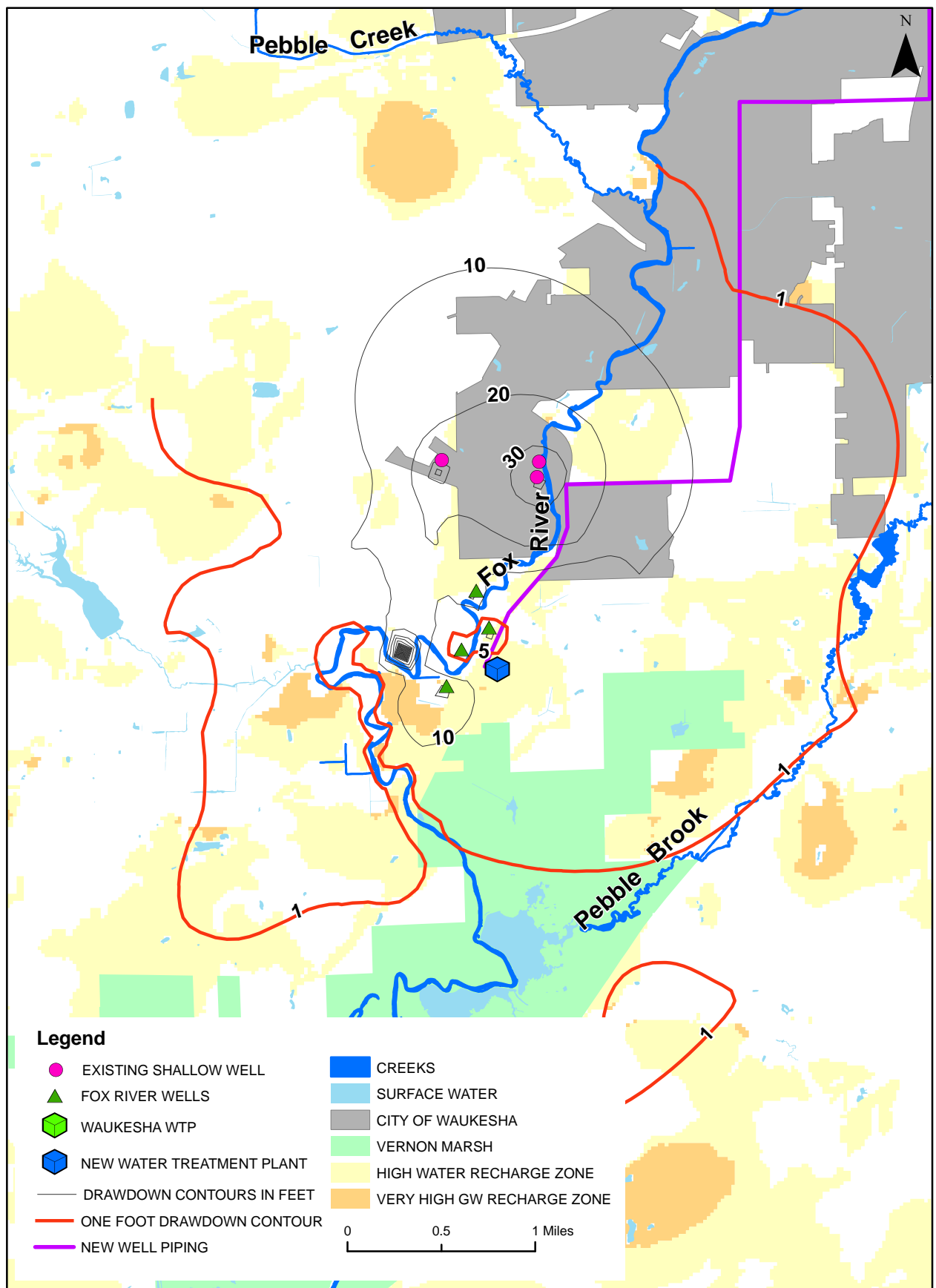


EXHIBIT 4
Shallow Aquifer Groundwater Contours at 2.7 mgd

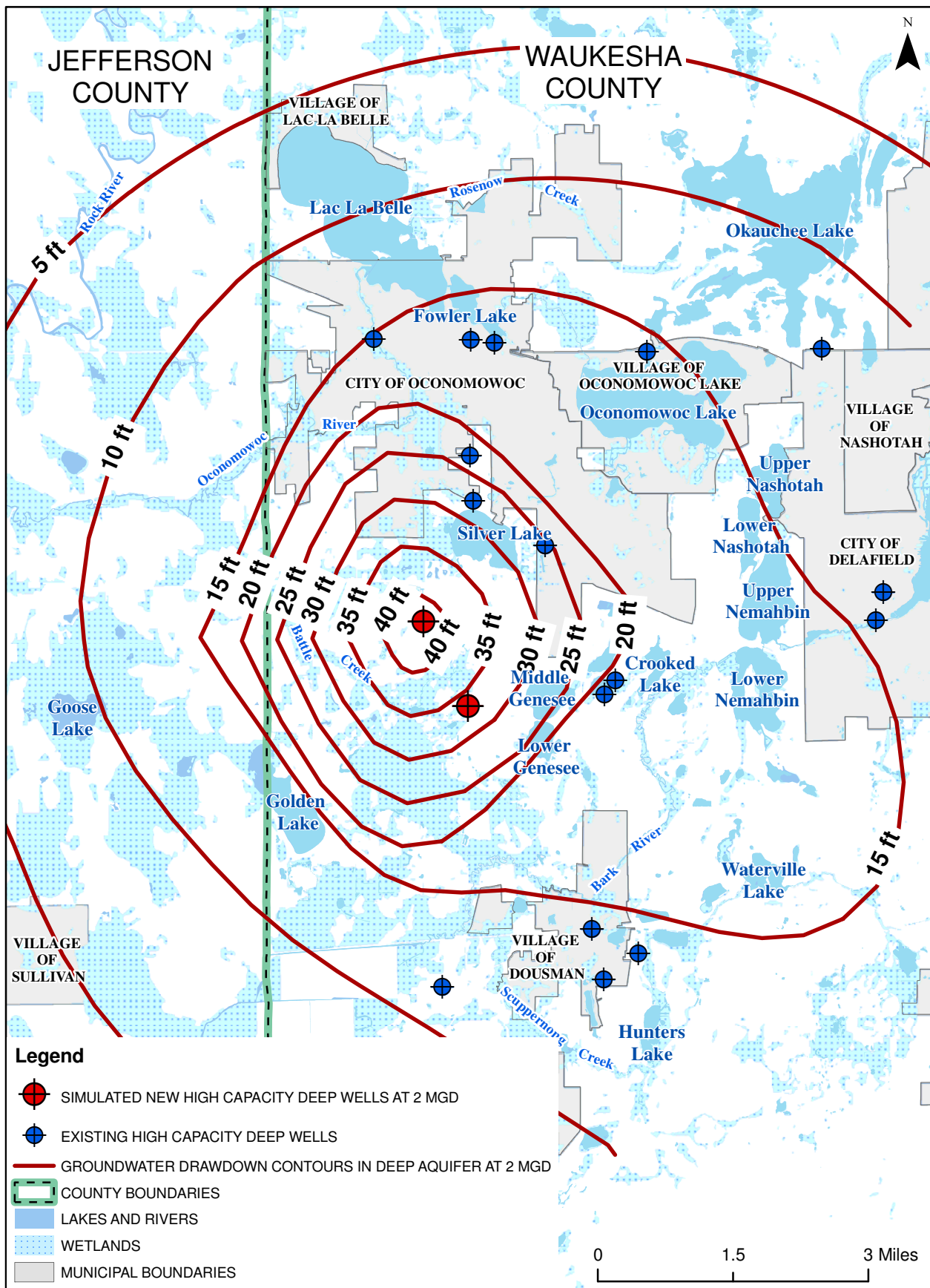


EXHIBIT 5
Deep Aquifer Groundwater Contours at 2 mgd From
Unconfined Deep Aquifer

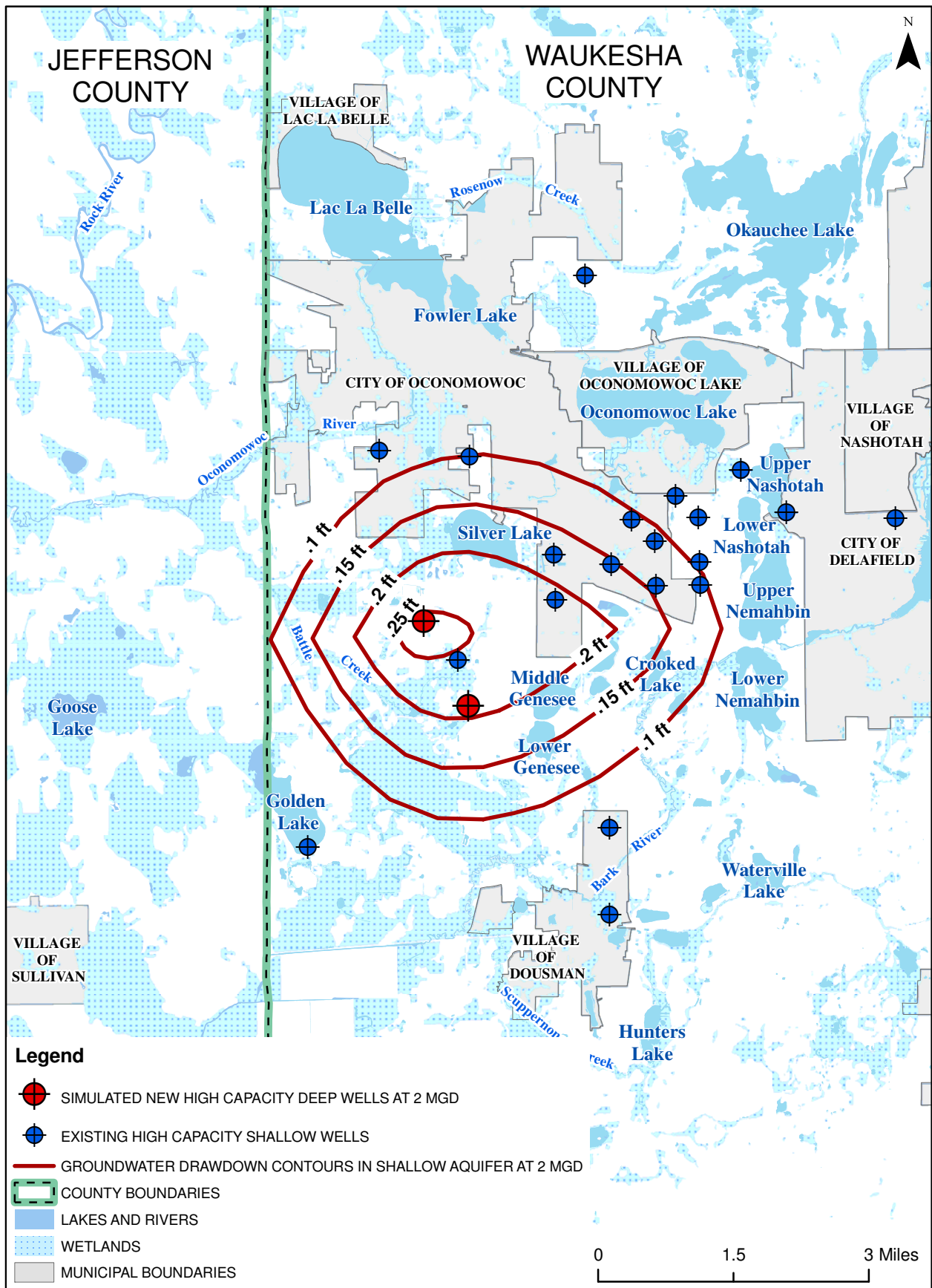


EXHIBIT 6
Shallow Aquifer Groundwater Contours at 2 mgd From
Unconfined Deep Aquifer

Multiple Water Supply Sources

Deep and shallow groundwaters, Silurian dolomite water, and quarry water are all hard waters, encouraging use of home water softeners. Continued and expanded use of water softeners increases salt discharge into the environment. It is estimated that Waukesha discharges 7.4 million pounds of salt into the Fox River each year from home water softeners. Water use also increases with the use of home water softeners. It is estimated that each household water softener produces 40 gallons of salty wastewater per regeneration. Continued use of hard groundwater would increase water and energy use while degrading conservation efforts.

It is estimated that this alternative would discharge more than 38,000 tons of greenhouse gases a year (carbon dioxide equivalent) through pumping from aquifers, quarry, water treatment, and pumping from the wellfield to Waukesha. This is more than double that of the Lake Michigan alternative (Exhibit 7).

Considering the environmental impacts of this alternative, a rating of “significant adverse impact” was applied. Extracting water from the shallow aquifer and riverbank inducement wells has significant adverse wetland impacts, even at lower withdrawal rates. This alternative also has the highest greenhouse gas emissions of all the alternatives due to extensive pumping and treatment from multiple sources. This alternative has greater adverse environmental impacts than the proposed Lake Michigan supply.

Long-Term Sustainability

Deep Aquifer

None of the water pumped from the deep aquifer is returned to its source. All the water is transferred from the deep aquifer to the Fox River and eventually to the ocean. Some of this water originated from the Lake Michigan basin.

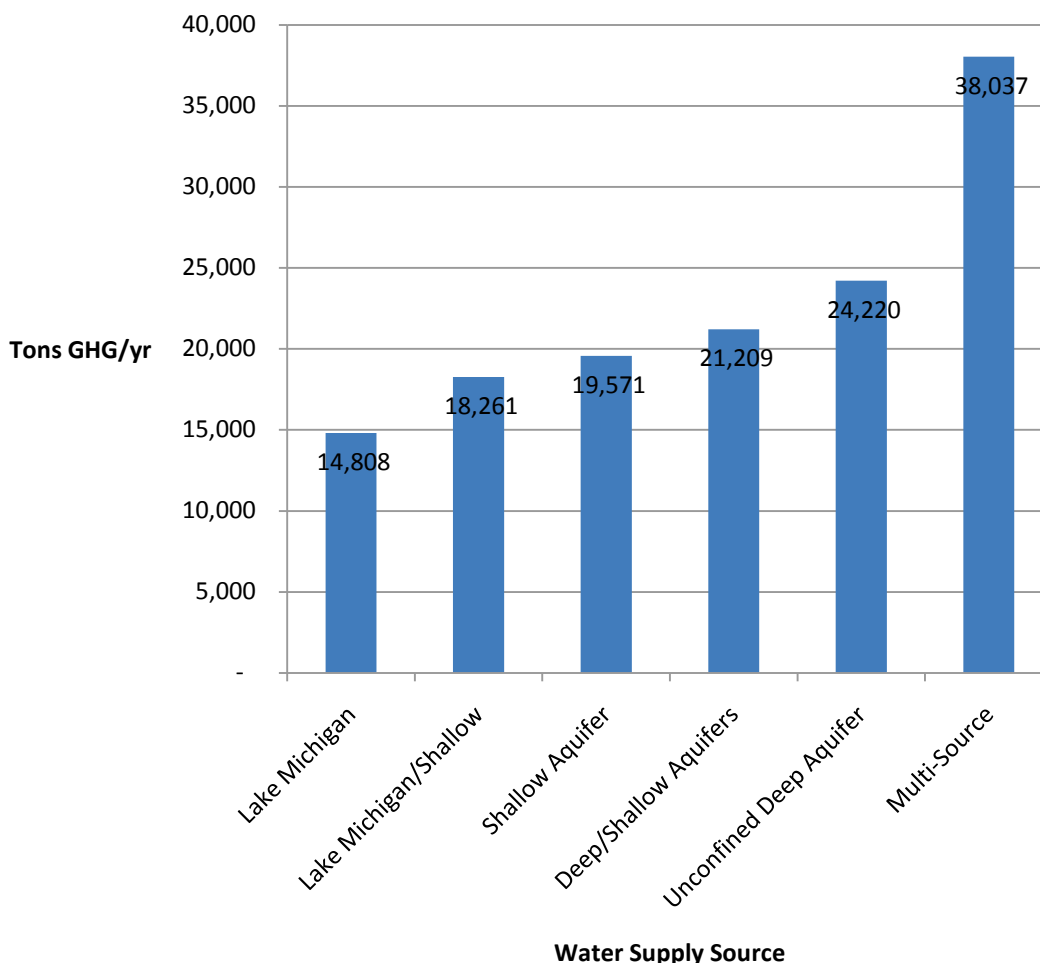
The deep aquifer is not significantly affected by drought, since the shale confining layer above the aquifer limits recharge near Waukesha. The aquifer is mainly recharged about 12 miles west of Waukesha where the shale confining layer subsides.

Reducing pumpage from the deep aquifer will reduce groundwater drawdown and extend the water supply further than current pumping. However, Waukesha pumps only about 25 percent of the water from the deep aquifer in southeastern Wisconsin and cannot control pumpage from other communities. Therefore, long-term sustainability of the deep aquifer is dependent on others using the water source and cannot be counted on. Even with reduced pumping, the deep aquifer groundwater levels will be significantly more than the 150 feet to be designated a groundwater management area (see Legal Exhibit D).

Shallow Aquifer and Riverbank Inducement

In this alternative, about 17% of the total average day water supply comes from riverbank inducement. Assuming 50% of this comes directly from the Fox River and is recycled, about 8% of the water is returned to the original source.

The shallow aquifer depends on rainwater for recharge, it is less reliable during drought conditions, when water supply is needed most.

EXHIBIT 7**Greenhouse Gas Production for Water Supply Alternatives**

Pumping water from the shallow aquifer and riverbank inducement wells at lower rates reduces the groundwater drawdown. In this alternative, a maximum groundwater drawdown of about 30 feet is observed in modeling.

Unconfined Deep Aquifer

None of the water extracted from the unconfined deep aquifer would be returned to its source. The water would be taken from the Rock River watershed, transferred to the Fox River and ultimately to the ocean.

The unconfined deep aquifer is less susceptible to drought than shallow aquifers, but will still be impacted by limited recharge. The unconfined deep aquifer is in the recharge zone for that aquifer, making it more reliable from a production standpoint than the deep confined aquifer or shallow aquifers.

Water pumped from the unconfined deep aquifer reduces the water that would otherwise recharge the deep aquifer near Waukesha.

Pumping from the unconfined deep aquifer at 2 mgd has a groundwater drawdown of about 46 feet, and 115 feet at 5 mgd.¹³ The aquifer in this area is already about 100 feet below predevelopment groundwater levels, so even at this reduced pumping rate the area could be designated as a groundwater management area (see Legal Exhibit D). This amount of groundwater drawdown can adversely affect long-term sustainability if pumping rates must be decreased to reduce drawdown or impacts on baseflow and surface water resources.

Quarry

The quarry water comes from rainfall and shallow groundwater discharge. This water is currently pumped into the Fox River. Some of this water would have flowed into the Fox River naturally through runoff and groundwater discharge. In this water supply alternative, the water would be returned to the Fox River, but downstream at the Waukesha wastewater treatment plant.

Drought will significantly impact water supply from the quarry since it depends on rain and shallow groundwater for water supply, both of which are adversely impacted by drought. In addition, any water that is stagnant in the quarry during a drought could undergo adverse water quality impacts such as algae growth and hydrogen sulfide formation that affect public perception.

Groundwater levels will not change significantly by using the quarries as a water supply source since the water is already extracted and discharged into the Fox River. If the quarries were allowed to partially fill with water, groundwater levels in the shallow aquifer near the quarries could actually increase.

The quarry is outside the City of Waukesha limits and not under the direct control of the City. Future use or ownership of the quarry may jeopardize long-term use of the quarry as a water supply source.

Silurian Dolomite Aquifer

None of the Silurian dolomite water would be returned to the original source. The water would be transferred to the Fox River and eventually to the ocean.

This aquifer is connected to the shallow aquifer and affected adversely by drought.

Although not modeled, the groundwater drawdown is not expected to be significant with the small amount of water withdrawn over a relatively large area.

The rapid contamination pathways also reduce the long term sustainability and reliability of these wells.

Multiple Water Supplies

Water is not returned to its source when deep groundwater, shallow groundwater or Silurian dolomite waters are pumped and discharged to surface water. Water is transferred out of the Great Lakes and Mississippi River ecosystem and eventually to the ocean. Even if it is

¹³ RJN Environmental Services, LLC. February, 2011. Summary of Groundwater Modeling Study. Reviewed by Dr. Kenneth R. Bradbury – Wisconsin Geological and Natural History Survey.

assumed that all the quarry water and 40% of the Fox River alluvium water is returned to its original source, that represents about 30 percent of the total average day water supply. This results in less water in the Great Lakes and Mississippi river watersheds and less long-term sustainability. One of the decision-making standards of the Compact (4.11.1) states “All Water withdrawn shall be returned, either naturally or after use to the Source watershed less allowance for Consumptive Use.” Since the deep aquifer and the waters of the Lake Michigan Basin are hydrologically connected, pumping the deep aquifer and discharging the water into the Fox River does not comply with this Compact decision-making standard.

Considering the long-term sustainability of this alternative, a rating of “significant adverse impact” was applied.

Public Health

Deep Aquifer

There are over 200 potential contamination sources in the deep aquifer wellfield. One of Waukesha’s deep wells was contaminated from outside sources in recent years and shut down, and another has been shut down because of potential contamination from a nearby landfill. Similar contamination in the future would require abandoning the wells or installing expensive treatment.

The deep aquifer exceeds drinking water radium and gross alpha regulations. While drinking water regulations can be met with proper treatment, if there is a malfunction in the treatment process or if new contaminants appear, the public may be exposed to the contaminants. However, since a smaller proportion of the total water supply is obtained from this source, the potential for radium exposure is less.

Shallow Aquifer and Riverbank Inducement

Shallow aquifers are more susceptible to contamination than deep confined or unconfined aquifers. Without a confining layer, the porous sand and gravel of shallow aquifers can quickly pass contaminants into the drinking water. Preventing a potential source of contamination (industry, a gas station) from locating near the wellfield is difficult, particularly when the wellfield is outside a municipality’s borders. The shallow wellfield is outside the City limits, and, as a result, the City would have limited zoning control to enforce a wellhead protection ordinance to protect the well. The WDNR requires a wellhead protection program to protect municipal wells from contamination. Buying large tracts of land or trying to influence land use zoning around the wellfield is possible but costly, and the effectiveness is uncertain.

There are 12 potential sources of contamination in the shallow aquifer wellfield pumping 2.7 mgd. A small amount of contaminant can poison an aquifer, making it unusable for long periods before remediation efforts are completed. This significantly reduces the reliability of the water supply.

Arsenic recently was detected in a future shallow aquifer wellfield site near Waukesha. The future shallow wells may exceed arsenic regulations and require treatment.

Riverbank inducement wells in the Fox River alluvium withdraw part of their water from the Fox River. The water is used, treated at the wastewater treatment plant, and discharged back

into the Fox River upstream of the wells. This reuse practice can increase contaminants and reduce public health protection. Over time, this practice will also increase salts in the water because home softening salt continuously is added to the water. High chlorides may exceed discharge permit regulations and cause expensive treatment to be implemented. Both of these factors reduce public health protection.

There are many residential properties in the shallow aquifer drawdown area that are not connected to a public sewer and wastewater treatment system. This could lead to potential contamination from associated septic tanks.

Unconfined Deep Aquifer

Like all aquifers, the unconfined deep aquifer is susceptible to contamination. However, it is less susceptible than the shallow aquifer because water is obtained from deeper in the earth and contaminant travel time is much greater. There are 3 potential sources of contamination within the one foot groundwater drawdown contour line. This is much less than in the deep confined and shallow aquifers. Preventing contamination will be more difficult, because the wellfield is outside the City limits, and, as a result, the City would have limited zoning control to enforce a wellhead protection ordinance to protect the wells.

The unconfined deep aquifer can produce good quality water and conventional groundwater treatment is typically required.

Quarry

Using an open surface water quarry as a water supply source increases the potential for contamination from surface water runoff or groundwater. Quarry operations use fuels and solvents that can contaminate groundwater. There are 127 potential contamination sources near the quarries that pose a risk to public health. Contamination in groundwater could be carried into the quarry. Urban runoff (stormwater) also could carry contaminants into quarries. Although contaminated water can be treated, the contaminants must be known ahead of time so that the proper treatment technology can be built into the treatment plant to protect public health. WDNR approval for using the quarry as a public water supply would be required and may not be approved because of the public health concern. To develop this water supply source, the permitting process would be extensive because there are no other drinking water quarry supplies in the state.

Surface water treatment would be required at a minimum for this water source. If other contaminants that cannot be removed by conventional surface water treatment were discovered, additional treatment would be required. Depending on the contaminant, this could significantly increase capital and operating costs.

Supplementing quarry water with water directly from the Fox River may increase the quantity of water available, but the environmental, public health, and regulatory concerns increase. Diverting surface water into direct contact with groundwater will have regulatory impacts. Storing water in a quarry would cause stagnation and adverse water quality impacts such as algae growth, lack of oxygen and release of undesirable compounds such as iron, manganese and hydrogen sulfide that can cause “rotten egg” odors in the water. This would increase treatment requirements and reduce public health protection.

Silurian Dolomite Aquifer

The recent report¹⁴ on the Silurian dolomite aquifer states: “The Silurian dolomite contains numerous fractures, voids and bedding plane enlargements that often act as open conduits for groundwater migration. Groundwater can flow through these open conduits rapidly, both horizontally and vertically, without any significant filtration. As a result, any contamination that enters the aquifer can be transported from hundreds to thousands of feet without significant attenuation.” This condition can cause wells to have adverse public health and environmental impacts by spreading contamination.

There is significant potential for contamination in the Silurian dolomite given the fractured nature of the aquifer and the 20 potential sources of contamination. Treatment to remove contaminants is possible, but it must be in place for the specific contaminant encountered to be effective. With the wide range of potential contaminants, public health protection is reduced, and wellhead protection and monitoring must be relied on more heavily. Since this aquifer is outside the City of Waukesha limits, implementing a wellhead protection plan will be much more difficult.

Multiple Water Supplies

Water utilities rarely have more than two primary water supply sources. A main principle of public drinking water supply is to obtain the water supply source with the highest quality and most reliability. If the water supply does not have adequate quantity, the next highest quality water supply source is obtained. Wisconsin Department of Natural Resources Administrative code NR 811.21 states: “The source of water selected as a surface water supply shall be from the best available source which is practicable. The source shall provide the highest quality water reasonably available which, with appropriate treatment and adequate safeguards, will meet the drinking water standards in ch. NR 809.” The American Water Works Association Statement of Policy on Public Water Supply Matters, Drinking Water Quality states: “All water utilities should deliver to the consumer drinking water that meets or surpasses all standards established by regulatory agencies. This objective is achieved most economically and effectively when the source water is taken from the highest-quality water source available. . . .” Recommended Standards for Water Works, a well known guide to drinking water system design published by the Great Lakes-Upper Mississippi River Board of State and Provincial Public Health and Environmental Managers states: “Each water supply should take its raw water from the best available source which is economically reasonable and technically possible.”

The multiple source alternative does not adhere to these principles. There is much more potential for contamination and public health impacts with this multi-source alternative than with the Lake Michigan alternative. Using these multiple water supply sources provides less public health protection because the supplies are exposed to a number of contaminants over a wider area. The multiple water sources are high in total dissolved solids, mainly from calcium, magnesium, carbonates, chlorides and sulfate. Home softening takes out calcium and magnesium but adds sodium. Sodium has been identified as an item to limit with certain health conditions, such as heart disease.

¹⁴ Ruekert & Mielke, letter report on the Silurian dolomite aquifer, February 28, 2011.

In addition, blending water from six different sources makes treatment and maintaining a consistent water quality difficult. This can impact water quality and impacts on distribution systems and home plumbing.

Considering the public health impacts of this alternative, a rating of “significant adverse impact” was applied.

Implementability

Deep Aquifer

From an implementation standpoint, deep aquifer wells already exist, so this water supply would be relatively easy to implement. However, future treatment to remove total dissolved solids and blending in the Hillcrest reservoir would add significant complexity to the system.

New well sites would not be required, but placing treatment on three existing sites will likely require demolition of nearby homes to provide space.

There would be less wells impacted by deep aquifer pumping if the pumping rate is reduced from current pumping rates.

Waukesha is part of a groundwater management area, and as a result, more requirements and restrictions could be placed on groundwater pumping in the future (see Legal Exhibit D).

Shallow Aquifer and Riverbank Inducement

Five new wells are needed for this water supply, plus a new water treatment plant. The riverbank inducement wellfield would be installed outside the City’s boundaries. Land purchase/lease and controls outside the city limits would be required. Residents near the shallow aquifer wellfield have opposed high capacity wells because of concerns about adequate water supply and impacts to wetlands, private wells, and other environmental resources. Even though the amount of water withdrawn is lower than the other alternatives, concerns and legal threats remain (See Legal Exhibit A for more details on the legal issues).

The new water treatment plant would require removal of iron, manganese, particles, microorganisms and potentially arsenic. Since some of the water is being drawn from the Fox River, surface water treatment would be required. If new contaminants are discovered, additional treatment would need to be constructed. A new pump station and transmission pipes are required to convey the treated water to the Hillcrest reservoir in Waukesha and throughout the City. The water treatment plant would likely be located outside the City limits and require land purchase or lease. The new wells, water treatment plant, and pump station would require ongoing operation and maintenance.

Riverbank inducement wells in the Fox River alluvium withdraw some of their water from the Fox River. The water is used, treated at the wastewater plant, and discharged back into the Fox River upstream of the wells. This reuse practice requires approval by WDNR and thus may jeopardize implementation. In addition, this water supply alternative may change the designation of the Fox River to a drinking water source, which may increase future wastewater treatment requirements for all facilities discharging into the Fox River, including Waukesha, Brookfield and Sussex.

Water transmission mains would need to be constructed from the riverbank inducement wellfield to the treatment plant, and from the treatment plant to Waukesha. This would require easements, and construction through rural and urban conditions.

This water supply would impact over 1,000 private wells within the 1 foot groundwater drawdown contour line.

Unconfined Deep Aquifer

This alternative would require the siting and construction of five wells, interconnecting piping, a pump station, a long transmission pipe to Waukesha, and a treatment plant for removal of iron and manganese and disinfection. Waukesha would have to operate and maintain a remote wellfield and pump station. In addition, a water treatment plant would have to be operated and maintained.

Each well, pump station and treatment plant would likely require land acquisition. Land purchase and easement requirements for the unconfined deep aquifer supply may be more difficult to implement than those of the shallow aquifer near Waukesha because of the greater distance from Waukesha. Lack of zoning control over adjacent lands will make wellhead protection difficult.

Pumping water from this aquifer would create an area of groundwater drawdown. There would be less wells impacted by groundwater drawdown than in Alternative 3 because the pumping rate is less than Alternative 3.

Installing high capacity wells in the unconfined aquifer west of the Maquoketa shale presents not only logistical but also definite legal problems. Installation of high capacity wells in an unconfined aquifer could result in legal challenges and expose the City to numerous damage claims (negligence, nuisance, unreasonable use of groundwater) from lake area homeowners, residents and businesses on private wells and municipalities. The wellfield area is far outside the City of Waukesha boundaries, and other private and municipal wells will be affected. Many lakes and surface water bodies will also be affected. These issues jeopardize implementation, long-term sustainability and reliability because wellfield production could be ordered to be reduced or stopped. See Legal Exhibit A for additional information on this issue.

If new wells need to be installed in the future because of declining water levels in existing wells or the need to locate wells farther from surface water resources, wells may need to be located a greater distance from Waukesha. Locating wells farther from Waukesha would increase costs, energy usage, and legal/public concerns. The environmental and legal impacts described above would become more severe.

Quarry

Obtaining quarry water would require water intake structures in each quarry, two pump stations, a surface water treatment plant and interconnecting piping. Each of these facilities would require land purchase or an easement agreement.

The quarries are owned and operated by private companies and not planned for future drinking water use. Even if Waukesha were able to purchase the quarries or obtain use of their water, there are significant water quality and public health concerns that may not allow their

use for drinking water. Permits from the WDNR and permission from the owners of the quarry would be required. The high potential for contamination makes permitting more difficult. Since no quarries are used for drinking water in Wisconsin, permits may not be granted.

Using quarry water for a drinking water supply would not impact private or municipal wells in the area any more than they are already impacted since water is pumped to the Fox River from these quarries now.

Silurian Dolomite Aquifer

This water source requires four wells, a water treatment plant, a pump station and interconnecting piping. These facilities will require land purchase.

Installing high capacity wells in the Silurian dolomite aquifer could result in legal challenges and expose the City to damage claims from residents, municipalities and businesses on wells in the zone of wellfield influence. These issues jeopardize implementation, long-term sustainability and reliability because wellfield production could be ordered to be reduced or stopped. See Legal Exhibit A for additional information on this issue.

This water source would have similar implementation issues as the shallow aquifer wells. However, finding locations for adequate water supply within the Silurian dolomite is uncertain. If wells are located, they will be farther from the City of Waukesha. This makes implementation more difficult. The ability of finding and developing adequate wells in the Silurian dolomite aquifer depends on many factors including the ability to obtain land in favorable areas outside Waukesha City limits and adequate water quality.

Multiple Water Supplies

In this alternative, Waukesha would operate and maintain four wellfields, four quarries, seven treatment plants, five pump stations, and numerous pipelines. Waukesha would also have six different water qualities to blend (deep aquifer, unconfined deep aquifer, shallow aquifer, Fox River alluvium, Silurian dolomite and quarry) and try to provide a consistent water quality to customers for public health protection and distribution system water quality. This will make operation and maintenance of the water utility much more complex than that of a Lake Michigan alternative. This complex system reduces implementability.

In addition, this alternative requires the most coordination with outside entities and has the most potential for legal and regulatory actions. Approximately 13 municipalities/counties/utility companies are anticipated to require coordination to construct the water supply facilities.

Considering the implementability of this alternative, a rating of “significant adverse impact” was applied.

Summary and Costs

Exhibit 8 summarizes the criteria for this multiple source water supply alternative.

EXHIBIT 8
Evaluation Criteria for Multiple Source Alternative

Major Criteria	Subcriteria	Rating	Overall
Environmental	Impact on Groundwater Resources	●	
	Aquatic Habitat Loss	●	●
	Operational Impacts to Wetlands	●	
	Impacts to Vegetation and Wildlife	●	
Long-Term Sustainability	Water Returned to Original Source	●	
	Supply Impacted by Drought	○	●
	Groundwater Drawdown	●	
Public Health	Nearby Contaminated Sources	●	
	Treatment Requirements	●	●
	Ability to produce Consistent Water Quality	●	
Implementability	Operation and Maintenance Complexity	●	
	Land Sites Required	●	
	Municipal/County/Utility Coordination Required	●	●
	Wells Impacted	●	

- No adverse impact ● Moderate adverse impact
 ○ Minor adverse impact ● Significant adverse impact

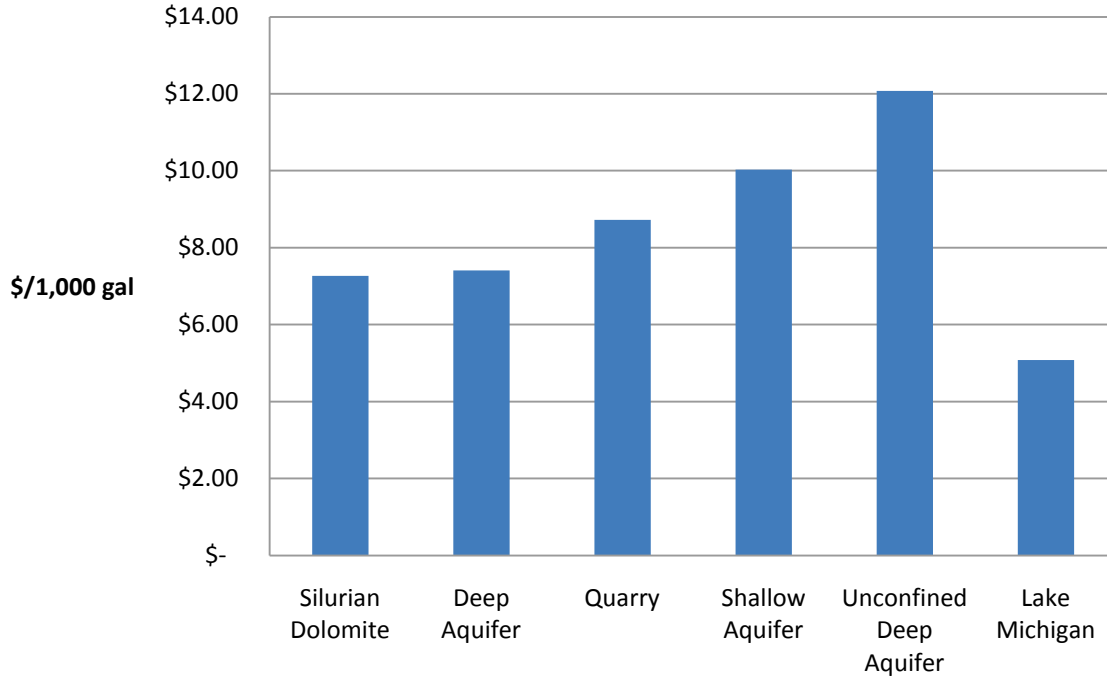
The capital cost of this alternative is estimated at \$319 million and the annual operation and maintenance cost at \$7.9 million. Additional cost information is in Attachment WS Cost. Exhibit 9 shows the capital and O&M cost of each water source in this multiple source alternative. Exhibit 10 shows the cost per thousand gallons of water from each of the water supply sources in the multiple source alternative, and compares it to Lake Michigan costs. The costs include capital and operation/maintenance costs to obtain, treat, and pump the water.

EXHIBIT 9
Cost of Multiple Water Sources

	Deep Aquifer	Shallow and Riverbank Inducement	Quarries	Unconfined Deep Aquifer	Silurian Dolomite
Capital cost, \$ million	65	75	67	85	28
O&M cost, \$ million	2.1	1.9	1.9	1.4	0.6
Average day, mgd	3	2.5	2.5	2	1

Each of the six water sources in the multiple source alternative is more expensive per gallon than the Lake Michigan alternative. Any combination of these six water supply sources with higher unit costs than the Lake Michigan alternative cannot be less expensive than the Lake Michigan alternative. Lake Michigan clearly is the most economical water supply source.

EXHIBIT 10
Unit Cost of Multiple Water Sources



The sustainability, environmental impact, implementability, and public health issues associated with unconfined deep aquifer and multiple water sources were discussed. The results compared to all water supply alternatives from the Application for Lake Michigan Water Supply are shown in Exhibit 11. Estimated costs are in Exhibit 12. These water supply alternatives are less sustainable, produce greater adverse environmental impact, are more difficult to implement, and are less protective of public health than a Lake Michigan water supply. They are also more expensive, individually or in combination, and thus are not reasonable water supply alternatives (see Legal Exhibit B).

EXHIBIT 11
Summary of Water Supply Alternatives Evaluation

Water Supply Alternatives	Major Criteria			
	Environmental	Public Health	Long-Term Sustainability	Implementability
1. Deep and shallow aquifers	●	●	●	●
2. Shallow aquifer and riverbank inducement	●	●	●	●
3. Unconfined deep aquifer	●	⊙	●	●
4. Multiple sources	●	●	●	●
5. Lake Michigan and shallow aquifer	●	⊙	⊙	●
6. Lake Michigan with return flow to Underwood Creek	⊙	⊙	○	⊙

○ No adverse impact ⊙ Moderate adverse impact
 ⊙ Minor adverse impact ● Significant adverse impact

EXHIBIT 12
Water Supply Alternative Cost Estimates

Water Supply Alternative	Capital Cost ^a (\$ million)	Annual Operation/Maintenance Cost (\$ million)	20 yr Present Worth Cost (\$ million, 6%)	50 yr Present Worth Cost (\$ million, 6%)
Deep and shallow aquifers	189	7.2	272	302
Shallow aquifer and riverbank inducement	184	7.4	269	301
Unconfined deep aquifer	228	6.6	304	332
Multiple sources	319	7.9	410	444
Lake Michigan and shallow aquifer	238	7.5	324	356
Lake Michigan with return flow to Underwood Creek	164	6.2	235	262

^aIncludes direct construction cost, contractor administrative costs (insurance, bonds, supervision etc), 25% contingency, and costs for permitting, legal, engineering, administrative.

Community water supplies are planned for the long term (50 years or more) and must use high quality, reliable, sustainable water sources. Failing to invest in water supply infrastructure that serves a community for the long term results in paying for water supply development twice, the second investment coming due when water sources are depleted or cannot be accessed because of regulations or lawsuits.

Attachment WS11
Technical Memorandum on
BRICO Groundwater Model

Technical Memorandum

Date: April 15, 2011

To: Mr. Daniel Duchniak, General Manager
Waukesha Water Utility

cc: Ms. Nancy Quirk, P.E., Technical Services Manager
Waukesha Water Utility

From: John Jansen, P.G., P.GP., Ph.D.

RE: **BRICO Groundwater Model**

Cardno ENTRIX

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As you know, I attended the presentation of the Brico modeling effort given to the Wisconsin Department of Natural Resources (WDNR) on April 1st in their offices in Madison. As per your request, I have prepared this memo with my observations and comments regarding the model.

The model was prepared by Daniel Feinstein of the USGS as pilot for a larger effort to model the surface water/groundwater interactions of the Fox River Watershed of Wisconsin and Illinois. As part of this pilot the USGS conducted some specific modeling efforts on behalf of the Brico Fund under the direction of Dr. Douglas Cherkauer, retired professor from UWM. This effort focused on the shallow aquifer in the upper Fox River Basin and included simulations of the zones of contribution for Waukesha Water Utility Wells 11, 12, and 13. Handouts were provided that detailed the specific findings of the model.

The modeling work by Daniel Feinstein was of a high professional standard and technical merit. Every model has a set of assumptions and preferences built into its design. The USGS used a statistical method to build this model that is meant to let the data drive the design rather than force the modeler to make fundamental assumptions that will affect the model results. I am concerned that the basic design of the model contains inherent data quality and data density problems that may limit the ability of the model to accurately simulate the aquifer system. Specifically, I am concerned that the use of the Hydro-Geologic Unit package (HGU) and an interpolation protocol using well construction reports from private home wells to construct the hydrogeological framework of the model. The HGU approach uses a model grid that defines model layers based on predefined depth ranges below land surface instead of defining layers based on geologic units. The properties of a grid cell are defined by a weighted averaging process for all of the geologic units described on a log that intersects the cell. The property of cells that do not have well logs are defined by an interpolation process from the closest cells with well logs.

While this approach is rigorous and unbiased, I believe it can lead to an inaccurate geologic framework where data is sparse. In the interpolation process used for the model, all geologic data from any well log is given equal weight. I know from experience that not all well logs are equal and some logs are mislocated or so inaccurate as to be misleading. Many well construction reports for private wells have incomplete or inaccurate formation logs due to the limits of the sampling methods employed or the fact that the driller's are more concerned about completing the well quickly than they are about obtaining detailed formation samples. In areas with dense data control, a few bad logs are smoothed out and have little effect. In areas with sparse control, a single bad log affects the properties of the model for a larger area. As a result, one bad formation log in an area of sparse control can create a significant anomaly in the geologic model of the aquifer that can locally dominate the flow in the model. That may be the case for the area around Wells 11, 12, and 13.

I believe it is safer to scrutinize well logs more carefully and only use the logs that you know are reliable or seem to fit the conditions of the area. Some modelers believe this approach introduces a bias in the model design. I prefer to think that this approach inserts professional geological judgment as a filter for bad data.

My main concern is the non-uniform distribution of the well data and its potential impacts on the interpolation algorithm to create the model. The well data used for the model is concentrated along the walls of the bedrock valley with only a few well logs within in the bedrock valley, especially in the area around Wells 11, 12, and 13. The interpolation method used gave all well logs equal weight so a few bad logs within the bedrock valley could create significant errors in the geologic frame work of the model in the area most important for induced recharge from surface water.

The current model contains a window of sand and gravel through the clay confining layer between the upper and lower sand units a short distance south of Well 11. This window is based on a well construction report for a single private well (well AY344, attached). This well was drilled using mud rotary, a method that is notoriously poor for getting accurate formation samples from the unconsolidated units. The log reports all sand and gravel from the surface to bedrock with the exception of a 6 inch clay layer. There are no other logs in the immediate vicinity of this well. All of the other logs from the same section describe thick clay layers (attached). It is likely that the formation at well AY344 may have contained layers of clay mixed with gravel that were reported as permeable sand and gravel units. If these units contained 10 to 30% clay or more, they hydraulically would act as a confining unit.

Due to the interpolation algorithm used, this single well log created a window through the confining unit in the model. This window allowed water to move from the river away from the pumping well in the upper sand unit, through the confining layer at the window, and then back toward the pumping well. The model estimated 60% of water pumped from Well 11 comes from the Fox River with a travel time of about 2 years and 20% of the water pumped from Well 12 comes from the river with a travel time of about 4 years. While this sort of flow pattern is possible, it is unusual and totally dependent on the validity of the log of well AY344.

The model was also used to simulate the flow pattern to a series of ten additional wells drilled near the Fox River. The model predicted that the hypothetical well field could produce about 7.6 mgd and induce

about 50% of that flow from the river. Given the uncertainty in the model layering apparent around Wells 11 and 12, it is clear to me that this simulation is likely to suffer from the same level of uncertainty. I think it is likely that similar windows through the confining unit may be present in the model based on one or two well logs. If the clay confining unit actually is more continuous than the current model design reflects, the results of the hypothetical well field are also likely to overestimate the induced flow from the river.

In the end, he informed me that the USGS has no intention of publishing the results of the simulations around Wells 11, 12, and 13. The intent was merely to show in concept how riverbank inducement could be used to reduce the drawdown from the shallow aquifer, not to provide a detailed model of the flow around Wells 11, 12 and 13. If the results were intended for qualitative conceptual purposes, it is not worth debating the details of its design. If the model is ever used for more quantitative analysis, then the details of the design and its inherent uncertainty are critical to the reliability of the results.

Conclusions

The model presented at the meeting was intended on the part of the USGS to be conceptual rather than site specific. The modeling was of high professional quality and used high technical standards. I have a concern that the methods used to develop the model layers may misrepresent the geologic conditions in areas with sparse data. Specifically, a questionable formation log from a single well appears to have dominated the flow pattern around Wells 11 and 12. The model assumes that a significant portion of the pumping from Wells 11 and 12 comes from the Fox River with a travel time of between 2 to 4 years. If this log is inaccurate, the volume of water induced from the river is likely to be much lower. No sensitivity analysis was made of the model results to the data from this single well log. Without this analysis it is impossible to quantify the uncertainty in the model predictions. This level of uncertainty appears to be inherent in the model and probably impacts the simulation of the hypothetical well field along the Fox River. If the results of the model are meant to illustrate a hypothetical well field, the current model is more than sufficient for that task. If the model is ever used to simulate the actual groundwater flow pattern for an existing or proposed well field, the degree to which the model design accurately reflects the hydrogeologic layering of the aquifers and confining units, and the degree of uncertainty created by the model design, must be evaluated before the results could be accepted as reliable and accurate.

WISCONSIN UNIQUE WELL NUMBER
SOURCE: WELL CONSTRUCTION

AY344

State of Wi-Private Water Systems-DG/2
Department Of Natural Resources, Box 7921
Madison, WI 53707

Form 3300-77A
(Rev 12/00)

City BRIAN TYNDALL		Telephone Number - -	
Mailing Address W264 S4811 RIVER RD			
City WAUKESHA	State WI	Zip Code 53186	
County of Well Location 68 WAUKESHA	Co Well Permit No W	Well Completion Date October 22, 1992	
Well Constructor MUNICIPAL WELL @		License # 13	Facility ID (Public)
Address 2201 BADGER CT		Public Well Plan Approval#	
City WAUKESHA	State WI	Zip Code 53188	Date Of Approval
Hicap Well #		Common Well #	gpm/ft

1. Well Location		Depth 123 FT	
T	T=Town C=City V=Village	Fire#	
of WAUKESHA			
Street Address or Road Name and Number W264 S4811 RIVER RD			
Subdivision Name		Lot# 1	Block #
Gov't Lot Section 29	or NW 1/4 of NE 1/4 of		
T 6 N R 19 E			
Latitude	Deg.	Min.	
Longitude	Deg.	Min.	
2. Well Type 2		1=New	
2=Replacement		(See item 12 below)	
3=Reconstruction			
of previous unique well #		constructed in 0	
Reason for replaced or reconstructed Well?			

3. Well Serves # of homes and/or (eg: barn, restaurant, church, school, industry, etc.)
P M=Munic O=OTM N=NonCom P=Private Z=Other
 X=NonPot A=Anode L=Loop H=Drillhole

High Capacity:
Well? **N**
Property? **N**

OWNER WANTED DEEP DRILLED
1 1=Drilled 2=Driven Point 3=Jetted 4=Other

4. Is the well located upslope or sideslope and not downslope from any contamination sources, including those on neighboring properties? **Y**

Well located in floodplain? **N**
 Distance in feet from well to nearest: (including proposed)

1. Landfill
- 95** 2. Building Overhang
3. 1=Septic 2= Holding Tank
- 80** 4. Sewage Absorption Unit
5. Nonconforming Pit
6. Buried Home Heating Oil Tank
7. Buried Petroleum Tank
8. 1=Shoreline 2= Swimming Pool

9. Downspout/ Yard Hydrant
10. Privy
11. Foundation Drain to Clearwater
12. Foundation Drain to Sewer
13. Building Drain
- 1=Cast Iron or Plastic 2=Other
14. Building Sewer 1=Gravity 2=Pressure
- 1=Cast Iron or Plastic 2=Other
15. Collector Sewer: ___ units ___ in. diam.
16. Clearwater Sump

17. Wastewater Sump
18. Paved Animal Barn Pen
19. Animal Yard or Shelter
20. Silo
21. Barn Gutter
22. Manure Pipe 1=Gravity 2=Pressure
- 1=Cast iron or Plastic 2=Other
23. Other manure Storage
24. Ditch
25. Other NR 812 Waste Source

5. Drillhole Dimensions and Construction Method			
From To		Upper Enlarged Drillhole	Lower Open Bedrock
Dia.(in.)	(ft)	(ft)	
8.8	surface	40	X -- 1. Rotary - Mud Circulation -----
			-- 2. Rotary - Air -----
			-- 3. Rotary - Air and Foam -----
6.0	40	123	-- 4. Drill-Through Casing Hammer
			-- 5. Reverse Rotary
			-- 6. Cable-tool Bit ___ in. dia -----
			-- 7. Temp. Outer Casing ___ in. dia. ___ depth ft.
			Removed ?
			Other

6. Casing Liner Screen Material, Weight, Specification			
From To		Material, Weight, Specification	Manufacturer & Method of Assembly
Dia.(in.)	(ft)	(ft)	
6.6			LB FOSTER, P.E. A53B, 18.97# STEEL
	surface	103	
Dia.(in.)	Screen type, material & slot size	From	To

8. Geology		From	To
Codes	Type, Caving/Noncaving, Color, Hardness, etc	(ft.)	(ft.)
S	SAND	0	6
AGG	LG. GRAVEL @ STONES	6	35
NY	FINE SAND @ GRAVEL	35	85
T_C	BROWN CLAY	85	87
AGS	HEAVY GRAVEL @ FINE SAND	87	101
L	LIMESTONE	101	123

9. Static Water Level		11. Well Is: A Grade	
0.0	feet A ground surface	14 in. A =Above B =Below	
..=Above B=Below		Developed? Y	
10. Pump Test		Disinfected? Y	
Pumping level 15.0 ft. below surface		Capped? Y	
Pumping at 10.0 GPM 1.00Hrs			

Sealant or Other Sealing Material

#

12. Did you notify the owner of the need to permanently abandon and fill all

[illegible]

WISCONSIN UNIQUE WELL NUMBER
Source: WELL CONSTRUCTION

LT367

State of Wi-Private Water Systems-DG/2
Department Of Natural Resources, Box 7921
Madison, WI 53707

Form 3300-77A
(Rev 02/02)bw

Property Owner **BELMAN, GARY** Telephone Number **- -**
Mailing Address **S54 W25616 HAZELHURS**

Depth **145** FT

City **WAUKESHA** State **WI** Zip Code **53186**
County of Well Location **68 WAUKESHA** Co Well Permit No **W** Well Completion Date **August 11, 1997**

Well Constructor **RICHARD L DANECKI** License # **124** Facility ID (Public)
Address **PO BOX 94** Public Well Plan Approval#
City **NORTH PRAIRIE** State **WI** Zip Code **53153** Date Of Approval
Hicap Permanent Well # Common Well # Specific Capacity **gpm/ft**

1. Well Location
T=Town C=City V=Village
T of **WAUKESHA** Fire#

Street Address or Road Name and Number
S54 W25616 HAZELHURST LN

Subdivision Name **HAZELHURST** Lot# **2** Block #

Gov't Lot or **SE 1/4 of SW 1/4 of Section 29 T 6 N;R 19 E**

Latitude Deg. Min.
Longitude Deg. Min.

2. Well Type 1 (See item 12 below) Lat/Long Method

1=New 2=Replacement 3=Reconstruction
of previous unique well # constructed in **0**

Reason for replaced or reconstructed Well?

NEW HOME

1 1=Drilled 2=Driven Point 3=Jetted 4=Other

3. Well Serves # of homes and or
P (eg: barn, restaurant, church, school, industry, etc.)

M= Munic O=OTM N=NonCom P=Private Z=Other X=NonPot A=Anode L=Loop H=Drillhole

High Capacity:
Well? **N**
Property? **N**

4. Is the well located upslope or sideslope and not downslope from any contamination sources, including those on neighboring properties? Y

Well located in floodplain? **N**
Distance in feet from well to nearest: (including proposed)

16 9. Downspout/ Yard Hydrant

10. Privy

20 11. Foundation Drain to Clearwater

12. Foundation Drain to Sewer

13. Building Drain

1=Cast Iron or Plastic 2=Other

40 14. Building Sewer 1 1=Gravity 2=Pressure

11=Cast Iron or Plastic 2=Other

15. Collector Sewer: units in . diam.

16. Clearwater Sump

17. Wastewater Sump

18. Paved Animal Barn Pen

19. Animal Yard or Shelter

20. Silo

21. Barn Gutter

22. Manure Pipe 1=Gravity 2=Pressure

1=Cast iron or Plastic 2=Other

23. Other manure Storage

24. Ditch

25. Other NR 812 Waste Source

Hole Dimensions and Construction Method			Lower Open Bedrock
	From	To	Upper Enlarged Drillhole
Dia.(in.)	(ft)	(ft)	
6.0	surface	145	-- 1. Rotary - Mud Circulation -----
			-- 2. Rotary - Air -----
			-- 3. Rotary - Air and Foam -----
			-- 4. Drill-Through Casing Hammer
			-- 5. Reverse Rotary
			-- 6. Cable-tool Bit _____ n. dia -----
			-- 7. Temp. Outer Casing _____ in. dia. _____ depth ft. Removed ?
			Other

6. Casing Liner Screen		Material, Weight, Specification	From	To
Dia. (in.)	Manufacturer & Method of Assembly		(ft.)	(ft.)
6.0	SAWHILL USA STD ERW A53 90 GRB BLACK PLAIN END 6625 OD X 280 WALL		surface	70
Dia.(in.)	Screen type, material & slot size		From	To

7. Grout or Other Sealing Material		#	
Method	From	To	Sacks Cement
Kind of Sealing Material	(ft.)	(ft.)	
#8 MESH BENTONITE	surface	70.0	

8. Geology		From	To
Type, Caving/Noncaving, Color, Hardness, etc		(ft.)	(ft.)
YC SAND GRAVEL @ CLAY		0	70
L Limestone		70	145

9. Static Water Level		11. Well Is:	
30.0 feet	B ground surface	14 in.	A Grade
	A=Above B=Below		A=Above B=Below
10. Pump Test		Developed?	Y
Pumping level	100.0 ft. below surface	Disinfected?	Y
Pumping at	20.0 GP M 3.0 hrs	Capped?	Y

12. Did you notify the owner of the need to permanently abandon and fill all unused wells on this property? N
If no, explain **NONE**

13. Initials of Well Constructor or Supervisory Driller **RLD** Date Signed **8/11/97**
Initials of Drill Rig Operator (Mandatory unless same as above) **SH** Date Signed **8/12/97**

Additional Comments? Variance Issued?
Owner Sent Label? **Y** More Geology?

Batch 466

WISCONSIN UNIQUE WELL NUMBER
Source: WELL CONSTRUCTION

LV112

State of Wi-Private Water Systems-DG/2
Department Of Natural Resources, Box 7921
Madison, WI 53707

Form 3300-77A
(Rev 02/02)bw

Property Owner HESIAK, BILL & GAIL		Telephone Number 414 -548 -0471	
Mailing Address s53 w25784 hazelhurst lane			
City WAUKESHA	State WI	Zip Code 53186	
County of Well Location 68 WAUKESHA	Co Well Permit No W	Well Completion Date May 12, 1997	

1. Well Location		Depth 159 FT
T=Town C=City V=Village T of WAUKESHA		Fire#
Street Address or Road Name and Number S53 W25784 HAZELHURST LN		
Subdivision Name HAZELHURST	Lot# 13	Block #

Well Constructor ROSCHI BROS WELL DRLG @ PUMP INC	License # 435	Facility ID (Public)
Address N10W28210 NORTHVIEW		Public Well Plan Approval#
City WAUKESHA	State WI	Zip Code 53188
High Capacity Permanent Well #	Common Well #	Specific Capacity 1.3 gpm/ft

Gov't Lot or	SE 1/4 of SE 1/4 of Section 29 T 6 N;R 19 E	
Latitude	Deg.	Min.
Longitude	Deg.	Min.

2. Well Type	1 (See item 12 below)	Lat/Long Method
1=New 2=Replacement 3=Reconstruction		
of previous unique well # _____ constructed in 0		

3. Well Serves	# of homes and or	High Capacity: Well? N
P	(eg: barn, restaurant, church, school, industry, etc.)	Property? N
M=Munic O=OTM N=NonCom P=Private Z=Other X=NonPot A=Anode L=Loop H=Drillhole		

Reason for replaced or reconstructed Well?
NEW CONSTRUCTION
1 1=Drilled 2=Driven Point 3=Jetted 4=Other

4. Is the well located upslope or sideslope and not downslope from any contamination sources, including those on neighboring properties? Y		
Well located in floodplain? N	9. Downspout/ Yard Hydrant	27 17. Wastewater Sump
Distance in feet from well to nearest: (including proposed)	10. Privy	18. Paved Animal Barn Pen
1. Landfill	16 11. Foundation Drain to Clearwater	19. Animal Yard or Shelter
15 2. Building Overhang	12. Foundation Drain to Sewer	20. Silo
50 3. 1=Septic 2= Holding Tank	13. Building Drain	21. Barn Gutter
98 4. Sewage Absorption Unit	1=Cast Iron or Plastic 2=Other	22. Manure Pipe 1=Gravity 2=Pressure
5. Nonconforming Pit	14. Building Sewer 1=Gravity 2=Pressure	1=Cast iron or Plastic 2=Other
6. Buried Home Heating Oil Tank	1=Cast Iron or Plastic 2=Other	23. Other manure Storage
7. Buried Petroleum Tank	15. Collector Sewer: _____ units _____ in. diam.	24. Ditch
8. 1=Shoreline 2= Swimming Pool	16. Clearwater Sump	25. Other NR 812 Waste Source

5. Drillhole Dimensions and Construction Method		8. Geology	
From To	Upper Enlarged Drillhole	Geology Codes	Type, Caving/Noncaving, Color, Hardness, etc
Dia.(in.) (ft)	X -- 1. Rotary - Mud Circulation	P	HARDPAN
8.8 surface 49	-- 2. Rotary - Air		
6.0 49 159	-- 3. Rotary - Air and Foam	L	LIMESTONE
	-- 4. Drill-Through Casing Hammer		
	-- 5. Reverse Rotary		
	-- 6. Cable-tool Bit _____ n. dia		
	-- 7. Temp. Outer Casing _____ in. dia. _____ depth ft.		
	Removed ?		
	Other		

6. Casing Liner Screen		9. Static Water Level		11. Well Is:	
Material, Weight, Specification	From To	30.0 feet	B ground surface	12 in.	A Grade
Dia. (in.) Manufacturer & Method of Assembly	(ft.) (ft.)		A=Above B=Below	Developed? Y	A=Above B=Below
6.0 BLACK STEEL PIPE WELDED JOINTS 18 97 LB ASTM A531780 PSI SAWHILL	surface 49			Disinfected? Y	
				Capped? Y	

7. Grout or Other Sealing Material		10. Pump Test		12. Did you notify the owner of the need to permanently abandon and fill all unused wells on this property?	
Method	From To	Pumping level	40.0 ft. below surface	If no, explain	
Kind of Sealing Material	(ft.) (ft.)	Pumping at	13.0 GP M 1.0 Hrs		
BENTONITE DRILLING FLUID	surface 49.0				
		13. Initials of Well Constructor or Supervisory Driller			
		RR 5/12/97			
		Initials of Drill Rig Operator (Mandatory unless same as above)			
		TDK 5/12/97			

Additional Comments? Variance Issued?
Owner Sent Label? **Y** More Geology?

Batch 447

WISCONSIN UNIQUE WELL NUMBER		RZ133	
SOURCE: ELECTRONICALLY SUBMITTED			
City WAUKESHA DEPT OF		Telephone Number 608 - 586 - 5544	
PARKS/LAND			
Mailing Address 1320 PEWAUKEE RD RM 230 WELL#3			
City WAUKESHA	State WI	Zip Code 53188	
County of Well Location 2 68 WAUKESHA	Co Well Permit No W	Well Completion Date August 19, 2002	
Well Constructor SAMS ROTARY		License # 370	Facility ID (Public)
Address PO BOX 150 N9935		Public Well Plan Approval#	
City RANDOLPH	State WI	Zip Code 53956	Date Of Approval
Flow Well # 69200	Common Well #	.1 gpm/ft	

3. Well Serves # of homes and or SHELTER (eg: barn, restaurant, church, school, industry, etc.) N M=Munic O=OTM N=NonCom P=Private Z=Other X=NonPot A=Anode L=Loop H=Drillhole		High Capacity: Well? N Property? N	Reason for replacement of contaminated Well: 1 = Drilled 2=Driven Point 3=Jetted 4=Other
4. Is the well located upslope or sideslope and not downslope from any contamination sources, including those on neighboring properties? Y			
Well located in floodplain? N Distance in feet from well to nearest: (including proposed)		9. Downspout/ Yard Hydrant 10. Privy 11. Foundation Drain to Clearwater 12. Foundation Drain to Sewer 13. Building Drain 1=Cast Iron or Plastic 2=Other 14. Building Sewer 1=Gravity 2=Pressure 1=Cast Iron or Plastic 2=Other 15. Collector Sewer: ___ units ___ in. diam. 16. Clearwater Sump	
1. Landfill 2. Building Overhang 3. 1=Septic 2= Holding Tank 4. Sewage Absorption Unit 5. Nonconforming Pit 6. Buried Home Heating Oil Tank 7. Buried Petroleum Tank 8. 1=Shoreline 2= Swimming Pool		17. Wastewater Sump 18. Paved Animal Barn Pen 19. Animal Yard or Shelter 20. Silo 21. Barn Gutter 22. Manure Pipe 1=Gravity 2=Pressure 1=Cast iron or Plastic 2=Other 23. Other manure Storage 24. Ditch 25. Other NR 812 Waste Source	

Grout or Other Sealing Material

WISCONSIN UNIQUE WELL NUMBER

SOURCE: ELECTRONICALLY SUBMITTED

QR587

State of Wi-Private Water Systems-DG/2
Department Of Natural Resources, Box 7921
Madison, WI 53707Form 3300-77A
(Rev 12/00)Property **WAUKESHA CTY DEPT OF** Telephone Number **920 - 927 - 1786**Owner **PARKS & LAND**Mailing Address **1320 PEWAUKEE RD RM 230 WELL #2**City **WAUKESHA** State **WI** Zip Code **53188**County of Well Location **2** Co Well Permit No **W** Well Completion Date **August 20, 2002**Well Constructor **SAMS ROTARY** License # **370** Facility ID (Public)Address **PO BOX 150 N9935** Public Well Plan Approval#City **RANDOLPH** State **WI** Zip Code **53956** Date Of ApprovalHicap Well # **69198** Common Well # **.5** gpm/ft3. Well Serves # of homes and or **MAINTENANC BLDG**
(eg: barn, restaurant, church, school, industry, etc.)
N M=Munic O=OTM N=NonCom P=Private Z=Other
X=NonPot A=Anode L=Loop H=DrillholeHigh Capacity:
Well? **N**
Property? **N**

1. Well Location

T T=Town C=City V=Village Fire# **W264**
of **WAUKESHA**Street Address or Road Name and Number
S4500 RIVER RD

Subdivision Name Lot# Block #

Gov't Lot or **NE** 1/4 of **NE** 1/4 of
Section **29** T **6** N R **19** ELatitude Deg. Min.
Longitude Deg. Min.

2. Well Type

1 1=New
2=Replacement (See item 12 below)3=Reconstruction
of previous unique well # _____ constructed in _____

Reason for replaced or reconstructed Well?

1 1=Drilled 2=Driven Point 3=Jetted 4=Other4. Is the well located upslope or sideslope and not downslope from any contamination sources, including those on neighboring properties? **Y**Well located in floodplain? **N**

Distance in feet from well to nearest: (including proposed)

1. Landfill
2. Building Overhang
3. 1=Septic 2= Holding Tank
4. Sewage Absorption Unit
5. Nonconforming Pit
6. Buried Home Heating Oil Tank
7. Buried Petroleum Tank
8. 1=Shoreline 2= Swimming Pool

9. Downspout/ Yard Hydrant

10. Privy

11. Foundation Drain to Clearwater

12. Foundation Drain to Sewer

13. Building Drain

1=Cast Iron or Plastic 2=Other

14. Building Sewer 1=Gravity 2=Pressure

1=Cast Iron or Plastic 2=Other

15. Collector Sewer: _____ units _____ in . diam.

16. Clearwater Sump

17. Wastewater Sump

18. Paved Animal Barn Pen

19. Animal Yard or Shelter

20. Silo

21. Barn Gutter

22. Manure Pipe 1=Gravity 2=Pressure

1=Cast iron or Plastic 2=Other

23. Other manure Storage

24. Ditch

25. Other NR 812 Waste Source

5. Drillhole Dimensions and Construction Method

From To		Upper Enlarged Drillhole	Lower Open Bedrock
Dia.(in.)	(ft)	(ft)	
6.0	surface	239	

- 1. Rotary - Mud Circulation -----
- 2. Rotary - Air ----- X
- 3. Rotary - Air and Foam -----
- X -- 4. Drill-Through Casing Hammer
- 5. Reverse Rotary
- 6. Cable-tool Bit _____ in. dia -----
- 7. Temp. Outer Casing _____ in. dia. _____ depth ft.
- Removed ?
- Other

6. Casing Liner Screen Material, Weight, Specification

Dia. (in.)	Manufacturer & Method of Assembly	From (ft.)	To (ft.)
6.0	STD BLK PIPE, .280 WAL WLD JNTS A53 SAWHILL	surface	116

Dia.(in.)	Screen type, material & slot size	From	To

7. Grout or Other Sealing Material

#

Geology Codes	8. Geology Type, Caving/Noncaving, Color, Hardness, etc	From (ft.)	To (ft.)
YC	Sand & Gravel, Clayey	0	5
Y	Sand & Gravel	5	58
X	Sand & Clay	58	82
Z	Clay & Gravel	82	116
L	Limestone/Dolomite	116	235
H	Shale	235	239

9. Static Water Level

39.0 feet B ground surface
..=Above B=Below

11. Well Is:

A Grade
18 in. A=Above B=Below

10. Pump Test

Pumping level 115.0ft. below surface

Pumping at 40.0 GPM 1.00Hrs

Developed? **Y**Disinfected? **Y**Capped? **Y**

12. Did you notify the owner of the need to permanently abandon and fill all

Attachment WS Cost
Cost Estimates for Water Supply Alternatives

Cost Estimates for Water Supply Alternatives

PREPARED FOR: Waukesha Water Utility

PREPARED BY: CH2M HILL

DATE: March 2011

Background

To plan for the City of Waukesha's long-term water supply needs, the Waukesha Water Utility conducted water supply studies and contributed to regional water supply planning efforts. During the past several years, alternative water supply strategies were investigated at the conceptual level, including cost estimates. The cost estimates were developed to meet the intent of Act 227, Wisconsin's Compact implementation statute, and water supply planning law (2007) as part of an application for Great Lakes water. These cost estimates were developed for relative comparison of water supply alternatives. They are not intended to reflect customer water rates.

Cost Estimate Basis

The cost estimates are based on conceptual information (proposed asset type, location, and capacity) and no design has been completed. They support strategic planning efforts that assess the feasibility of different alternatives and screen project options. The estimates are prepared for the purpose of long-range capital planning. These cost estimates were prepared for guidance in comparing alternatives based on information available at the time of the estimate. Detailed engineering design has not been done. The final cost estimate of any project will depend on market conditions, site conditions, final project scope, schedule, and other variable factors. As a result, final project costs may vary from the estimates presented here.

Examples of estimating methods include cost/capacity curves, scale-up factors, historical cost information and parametric modeling techniques. The cost estimates include the following:

- Preliminary pipeline alignments and facility siting plans to meet Wisconsin Department of Natural Resources environmental reporting and cost-effectiveness reporting requirements. The cost estimates factor in road, highway and water crossings for each mile of pipeline. Specific unit costs were developed for pipeline construction in open country, low urban, medium urban, and high urban areas. The unit costs account for other utilities in the same pipeline corridor (gas, electric, telephone, cable, sewer) and the occasional routing adjustment of the pipeline to avoid obstacles. For example, the cost of a 36-inch-diameter pipe is estimated at \$320 per foot in low urban areas and \$592 per foot in high urban areas. The higher unit cost is used in congested areas with many other utilities.
- Treatment strategies for the groundwater supply alternatives considered water quality data on both the deep and shallow aquifers. For example, arsenic removal treatment was used for shallow groundwater because of the recent discovery of arsenic in the future shallow wellfield. Disinfection was used because shallow groundwater modeling indicated a significant surface water influence could be present. The trend of increasing total dissolved solids in the deep aquifers resulted in desalination treatment being added

in 2020. The quarry water was treated as surface water, but no additional treatment for potential contaminants was added.

CH2M HILL's proprietary Parametric Cost Estimating System (CPES) was used to generate water treatment plant construction, operation, and maintenance cost estimates by inputting fundamental water treatment process design criteria. The tool generates facility footprints to support site layout development and facility planning for quick assessment of cost and space impacts of alternatives. CPES uses updated industry databases and actual costs from other projects.

- Development costs for new shallow wells reflect recent shallow well costs and Lathers property wellfield planning.
- Electrical power costs reflect 2009 Water Utility rates.
- Backup power generation systems are included in the estimates for pump stations, wells, and treatment plants.
- Wastewater disposal costs are included for the water treatment plant residuals.
- Greenhouse gas estimates are prepared for all the alternatives to quantify this environmental impact.

Construction cost estimates include the following:

- Contractor bonds and insurance: 3 percent
- Contractor mobilization and demobilization: 5 percent
- Contractor overhead: 8 percent
- Contractor profit: 4 percent
- Project contingency: 25 percent

Further, the estimated total construction costs include:

- Engineering, planning, and design: 8 percent
- Permitting, legal, and administration: 12 percent
- Engineering services during construction: 8 percent

Note: Costs are in 2010 dollars, and there is no escalation to the midpoint of construction. This is appropriate for relative cost comparison of alternatives. When the project and construction schedule are better defined, escalation costs can be added.

Capital and Life-Cycle Costs

Exhibit 1 summarizes the capital, operation/maintenance and present worth costs of the water supply alternatives. Appendix M of the Application for Lake Michigan Water Supply contains the detailed backup for the estimates.

Major changes from the last cost estimate include:

- A new water supply alternative from the unconfined deep aquifer about 12 miles west of Waukesha was added. It includes a new wellfield, pipeline, treatment plant, and pump station to convey water to the Hillcrest Reservoir.

- A new alternative for water supply from six separate sources was added (deep aquifer near Waukesha, deep unconfined aquifer west of Waukesha, Silurian dolomite aquifer, shallow aquifer, Fox River alluvium (riverbank inducement), and quarries north of Waukesha). This alternative includes costs to obtain, treat, and convey water to the Hillcrest reservoir.

Additional information on the capital and operation/maintenance costs for these water supply alternatives is attached.

EXHIBIT 1

Water Supply Alternative Cost Estimates

Water Supply Alternative	Capital Cost ^a (\$ million)	Annual Operation/Maintenance Cost (\$ million)	20 yr Present Worth Cost (\$ million, 6%)	50 yr Present Worth Cost (\$ million, 6%)
Deep and shallow aquifers	189	7.2	272	302
Shallow aquifer and Fox River alluvium	184	7.4	269	301
Unconfined deep aquifer	228	6.6	304	332
Multiple Source (Deep, shallow aquifers, riverbank inducement, quarries, Silurian dolomite)	319	7.9	410	444
Lake Michigan and shallow aquifer	238	7.5	324	356
Lake Michigan with return flow to Underwood Creek	164	6.2	235	262

^aIncludes direct construction cost, contractor administrative costs (insurance, bonds, supervision etc), 25% contingency, and costs for permitting, legal, engineering, administrative.

Alternative 3 - Unconfined Deep Aquifer

Capitall Cost

	Quantity	Unit Cost	Total
Unconfined Deep Aquifer Wellfield			\$ -
New wells @ 1.5 mgd each	14	\$ 500,000	\$ 7,000,000
Well houses and pumps	14	\$ 300,000	\$ 4,200,000
Land	14	\$ 300,000	\$ 4,200,000
Roads, ft	47,520	\$ 25	\$ 1,188,000
Interconnecting pipe, 12" to 24", ft	47,520	\$ 150	\$ 7,128,000
Electrical (10% of above)	23,716,000	\$ 0.1	\$ 2,371,600
Unconfined Deep Aquifer Supply Pipeline to Waukesha			\$ -
15 miles 36", rural	79,200	\$ 350	\$ 27,720,000
5 miles 36", urban	26,400	\$ 600	\$ 15,840,000
Unconfined Deep Aquifer Treatment Plant and Pump Station			\$ -
One @ 20 mgd	20,000,000	\$ 1.75	\$ 35,000,000
Land	1	\$ 1,000,000	\$ 1,000,000
Sludge Pipeline			\$3,332,000
Distribution System Improvements			\$ 8,465,000
Subtotal			\$ 117,444,600
3% markup for Bonds & Insurance			\$3,524,000
5% markup for Mob/Demob			\$5,873,000
8% markup for Contractors Overhead			\$10,148,000
4% markup for Contractors profit			\$5,074,000
25% Contingency			\$35,516,000
Subtotal Markups and Contingency			\$ 60,135,000
Total Project Construction Costs			\$ 177,579,600
% allowance for engineering and design			\$14,207,000
allowance for permitting, legal and admin.			\$21,310,000
ice for engr services during construction			\$14,207,000
Subtotal Other Project Costs			\$49,724,000
TOTAL PROJECT CAPITAL COST			\$ 228,000,000

O&M Cost Alternative 3 - Unconfined Deep Aquifer

Source of Supply	Units	Quantity	Unit Cost	Ext. Cost	\$/yr	Total
Deep Well pumping/maintenance	\$/1000 gal	3,978,500	\$	0.35	\$ 1,392,475	\$ 1,392,475
Total Supply						\$ 1,392,475
Treatment/Pumping	Units	Quantity	Unit Cost	Ext. Cost	\$/yr	
Deep Wells	\$/1000 gal	3,978,500	\$	0.50	\$ 1,989,250	\$ 1,989,250
Residuals	\$/1000 gal	79570	\$	4	\$ 318,280	\$ 318,280
Total Treatment/Pumping						\$ 2,307,530
Home Softening	Units	Quantity	Unit Cost	Ext. Cost	\$/yr	
Salt/Equipment/Replacement		1			\$ 2,863,894	
						\$ 2,863,894
Transmission	Units	Quantity	Unit Cost	Ext. Cost	\$/yr	
O&M	\$/lf/yr	137,280	\$	1	\$ 71,386	\$ 71,386
Total Transmission						\$ 71,386
Alternative Total O&M (\$/yr.)						\$ 6,600,000
PRESENT WORTH (6%, 20 yrs)						\$ 76,000,000
PRESENT WORTH (6%, 50 yrs)						\$ 104,000,000

Alternative 4 - Deep, Shallow Aquifer, Quarry, Unconfined Deep, Silurian Dolomite

Deep wells 3,8,10. Firm 4 mgd, avg 2 mgd, assume treatment in year 10

Quarries 5 mgd firm, 2.5 mgd avg Treat in new surface water plant

Unconfined Sandstone, 5 wells, 1.5 mgd each, firm 6 mgd, avg 3 mgd, 12 miles from Waukesha, treated in iron/manganese plant

Shallow wells, 3 fox river alluvium @ 1.5 mgd each, 3 existing @ 0.5 mgd each, 4 mgd firm, 2.5 mgd avg, treat in new surface water plant

Silurian Dolomite, 4 wells @ 0.4 mgd each, 2 mgd firm, 1 mgd average, treat in new iron/manganese plant

Capitla Cost

	Quantity	Unit Cost	Total	
Deep Well Treatment Plant				
3 wells, Present worth of Future 2020 cost			\$ 17,467,309	
Shallow Aquifer Water Treatment Plant				
One @ 4 mgd	4,000,000	\$ 4	\$ 16,000,000	
sludge pipeline			\$3,332,000	
Land	1	\$ 2,000,000	\$ 2,000,000	
Shallow Aquifer Wellfield				
new wells and wellhouses @ 1.5 mgd each	3	\$ 700,000	\$ 2,100,000	
Land	3	\$ 250,000	\$ 750,000	
Roads, ft	7,000	\$ 25	\$ 175,000	
Interconnecting pipe, 12", ft	10,000	\$ 144	\$ 1,440,000	
Electrical (10% of above)	4,465,000	\$ 0.1	\$ 446,500	
			\$ -	
Shallow Aquifer Supply Pipeline to Waukesha			\$ -	
10 miles of 16" for 4 mgd	52,800	\$ 235	\$ 12,408,000	
Subtotal Shallow Aquifer				\$ 38,651,500
Unconfined Deep Aquifer Treatment Plant			\$ -	
One @ 6 mgd	6,000,000	\$ 2	\$ 12,000,000	
Land	1	\$ 500,000	\$ 500,000	
Unconfined Deep Aquifer Wellfield			\$ -	
5 new wells and wellhouses @ 1.5 mgd each	5	\$ 1,200,000	\$ 6,000,000	
Land	5	\$ 300,000	\$ 1,500,000	
Roads, ft	15,840	\$ 25	\$ 396,000	
Interconnecting pipe, 12", ft	15,840	\$ 144	\$ 2,280,960	
Electrical (10% of above)	10,176,960	\$ 0.1	\$ 1,017,696	
Unconfined Deep Aquifer Supply Pipeline to Waukesha			\$ -	
12 miles 20", rural	63,360	\$ 180	\$ 11,404,800	
5 miles 20", urban	26,400	\$ 330	\$ 8,712,000	
Unconfined Deep Aquifer Subtotal				\$ 43,811,456
Quarry Water Treatment Plant			\$ -	
intakes @ 2 mgd each	4	\$ 1,500,000	\$ 6,000,000	
Intake pump stations	2	\$ 500,000	\$ 1,000,000	
Land	1	\$ 500,000	\$ 500,000	
One water plant @ 5 mgd	5,000,000	\$ 4	\$ 20,000,000	
4" Sludge pipeline	21,120	\$ 76	\$ 1,605,120	
Quarry Supply Pipeline to Waukesha			\$ -	
7 miles 16", rural	36,960	\$ 142	\$ 5,248,320	
Quarry Subtotal			\$ -	\$ 34,353,440

Silurian Dolomite Aquifer Treatment Plant				\$ -
One @ 2 mgd	2,000,000	\$ 2	\$ 4,000,000	
Land	1	\$ 500,000	\$ 500,000	
Silurian Dolomite Aquifer Wellfield				\$ -
5 new wells and wellhouses @ .5 mgd each	5	\$ 700,000	\$ 3,500,000	
Land	5	\$ 300,000	\$ 1,500,000	
Roads, ft	10,560	\$ 25	\$ 264,000	
Interconnecting pipe, 6", ft	21,120	\$ 72	\$ 1,520,640	
Interconnecting pipe, 12", ft	10,560	\$ 73	\$ 770,880	
Electrical (10% of above)	6,784,640	\$ 0.1	\$ 678,464	
Silurian Dolomite Aquifer Supply Pipeline to Waukesha				\$ -
2 mile 12", urban	10,560	\$ 171	\$ 1,805,760	
<u>Silurian Dolomite Aquifer Subtotal</u>				\$ 14,539,744
Distribution System Improvements			\$ 15,855,993	
Subtotal			\$ 164,679,442	
3% markup for Bonds & Insurance			\$4,941,000	
5% markup for Mob/Demob			\$8,234,000	
8% markup for Contractors Overhead			\$14,229,000	
4% markup for Contractors profit			\$7,115,000	
25% Contingency			\$49,800,000	
Subtotal Markups and Contingency			\$ 84,319,000	
Total Project Construction Costs			\$ 248,998,442	
8% allowance for engineering and design			\$19,920,000	
12% allowance for permitting, legal and admin.			\$29,880,000	
8% allowance for engr services during construction			\$19,920,000	
Subtotal Other Project Costs			\$69,720,000	
<u>TOTAL PROJECT CAPITAL COST</u>			\$ 319,000,000	

O&M Cost Alternative 4 - Deep and Shallow wells, Quarries and West Sandstone

Source of Supply	Units	Quantity	Unit Cost	Ext. Cost	\$/yr	Total
Deep Well pumping/maintenance	\$/1000 gal	1825000	\$	0.35 \$	638,750 \$	638,750
Shallow Well Pumping/Maintenance	\$/1000 gal	912500	\$	0.14 \$	127,750 \$	127,750
Quarry pumping/Maintenance	\$/1000 gal	912500	\$	0.14 \$	127,750 \$	127,750
Dolomite well pumping/Maintenance	\$/1000 gal	365000	\$	0.14 \$	51,100 \$	51,100
Total Supply						\$ 945,350
Treatment/Pumping	Units	Quantity	Unit Cost	Ext. Cost	\$/yr	
Deep Wells 6,8,10					\$	646,449
Shallow Wells and Quarry	\$/1000 gal	1,825,000	\$	1.11 \$	2,025,750 \$	2,025,750
Unconfined Wells	\$/1000 gal	1,095,000	\$	0.50 \$	547,500 \$	547,500
Residuals		140525	\$	4 \$	562,100 \$	562,100
Dolomite Wells	\$/1000 gal	365,000	\$	0.50 \$	182,500 \$	182,500
Total Treatment/Pumping						\$ 3,964,299
Home Softening	Units	Quantity	Unit Cost	Ext. Cost	\$/yr	
Salt/Equipment/Replacement		1			\$	2,863,894
						\$ 2,863,894
Transmission	Units	Quantity	Unit Cost	Ext. Cost	\$/yr	
O&M	\$/lf/yr	290400	\$	1 \$	151,008 \$	151,008
Total Transmission						\$ 151,008
Alternative Total O&M (\$/yr.)						\$ 7,900,000
PRESENT WORTH (6%, 20 yrs)						\$ 91,000,000
PRESENT WORTH (6%, 50 yrs)						\$ 125,000,000

Multi-Source Cost
from Each Source

	<u>Shallow Aquifer/Fox</u>			<u>Unconfined Deep</u>			
	<u>Deep Aquifer</u>	<u>River Alluvium</u>		<u>Quarry</u>	<u>Aquifer</u>	<u>Silurian Dolomite</u>	<u>Lake Michigan</u>
Capital	\$ 64,647,207	\$ 74,983,910	\$	66,645,674	\$ 84,994,225	\$ 28,207,103	\$ 164,000,000
O&M	\$ 2,105,354	\$ 1,877,922	\$	1,877,922	\$ 1,473,995	\$ 580,366	\$ 6,200,000
Annual cost of capital and O&M(20 yrs, 6%)	\$ 8,105,354	\$ 8,877,922	\$	7,877,922	\$ 8,473,995	\$ 2,580,366	\$ 20,200,000
MGD, ADD	\$ 3.0	\$ 2.5	\$	2.5	\$ 2.0	\$ 1.0	\$ 10.9
\$/1000 gal	\$ 7.40	\$ 9.73	\$	8.63	\$ 11.61	\$ 7.07	\$ 5.08

Racine - Lake Michigan Direct Return Flow

Mile	Cost	Comments	
1	\$2,389,306	0.75 mi follows river, crosses Prairie ave, Marshall and Dunbar, 0.25 under alley to NW ave	First 4.3 miles is common with all return flow alternatives
2	\$2,389,306	Cross Maple, Grand, Barstow, East, Barney, Hartwell, crossing of E Broadway (major street); end at Oakland follows path (cross Greendale and Frederick), cross	
3	\$3,290,285	East Side bypass HYW 59 (MAJOR) Follows New Berlin trail/utility corridor, cross	
4	\$2,624,244	Springdale; also a stream crossing, some forest (assume 20%); ends near stream crossing Follows trail, open country mostly, some forest (assume 30%), wetlands for 0.5 mi; assume	
5	\$2,221,655	groundwater; ends near wetlands/open water pond	
6	\$2,088,647	Utility corridor, cross Nicholson Rd, 0.25 mi wetland, 70% cross access road	Same alignment as Racine water supply
7	\$3,068,937	70% Utility corridor, cross HWY 38, cross 4-lane road Utility corridor, cross HWY V and 41 and frontage	
8	\$4,414,798	70% roads	
9	\$1,588,023	70% Utility corridor, cross 43rd and 51st Streets	
10	\$1,483,242	70% Utility corridor, cross 60th Street	
11	\$1,483,242	70% Utility corridor, cross 76th Street	This portion of the alignment is unique to Racine return flow alignment
12	\$1,483,242	70% Utility corridor, cross 92nd Street	
13	\$1,483,242	70% Utility corridor, cross 108th Street	
14	\$2,137,545	70% Utility corridor, cross HWY 45	
15	\$1,870,701	70% Utility corridor, 2 access roads, wetland	
16	\$1,378,460	70% Utility corridor	
17	\$1,600,597	70% Utility corridor, cross 7 Mile Rd, cross small creek Utility corridor, cross 8 Mile Rd, cross small creek,	
18	\$1,600,597	70% cross access road	
19	\$2,080,776	70% Utility corridor, cross Loomis Rd, wetland Utility corridor, cross 2 creeks, cross Muskedo Dam	
20	\$2,227,890	70% Rd, wetland	
21	\$1,710,036	70% Utility corridor, cross 3 creeks, 0.05 forest Utility corridor, cross Parker Dr and Racine Ave, creek	
22	\$1,600,597	70% crossing	
23	\$1,823,479	70% Utility corridor, cross Hennelberry Rd, wetland Utility corridor, cross access road, Janesville Rd,	
24	\$1,823,479	70% wetland	
25	\$1,823,479	70% Utility corridor, cross Field Rd, wetland Utility corridor, cross Trans Dr, Quarry Rd, HWY 43,	
26	\$2,915,024	70% National Avenue, wetland	
27	\$1,823,479	70% Utility corridor, cross Glengarry Rd, wetland	
28	\$1,233,429	70% Utility corridor, cross access road, Lawnsdale Rd	
29	\$1,202,294	70% Utility corridor, cross Beehelm Rd Utility corridor, cross 2 access roads, Racine Ave,	
30	\$1,269,354	70% Hanek Drive, and residential street Utility corridor, cross Cleveland Ave, cross 2 creeks,	
31	\$1,909,620	70% wetland	
32	\$1,468,938	70% Utility corridor, cross Lincoln Ave, cross creek	
33	\$1,874,949	Cost notes: 0.2 miles forest, 0.8 miles open country Alignment notes: 0.3 miles east then return pipe splits from water supply pipe. Return pipe continues east. Supply pipe goes south. 0.7 miles (0.2 miles through 100% forest) Cost notes: 0.95 miles open country; 0.05 miles for one road crossing	
34	\$1,700,456	Alignment notes: 0.35 miles east to road. 0.4 miles east then turn north for 0.25 miles. Cost notes: 0.9 miles open country; 0.1 miles for 2 road crossings	
35	\$1,713,001	Alignment notes: At beginning of mile 35 pipeline starts to follow a road east. 0.45 miles east to intersection with another road, 0.5 miles east to another 100% intersection. Cost notes: 0.1 miles for hwy crossing; 0.9 miles open country	
36	\$2,431,503	Alignment notes: 0.2 miles east to hwy. Another 0.8 miles to shore.	
37	\$4,500,000	0.5 miles east into lake. Based on water supply asset mgmt work, a 0.5 mile 42" intake costs about \$4.5M (60' depth) and a 1 mile intake costs \$9M. 100%	
subtotal	\$75,727,852		

Racine - Lake Michigan Direct Return Flow

Pipelines		\$75,728,000
10% allowance for pipeline valves & appurtenances		\$7,573,000
Pipeline Construction Cost		\$83,301,000
WWTP Effluent Pump Station		\$3,830,000
Conveyance System Construction Cost		\$87,131,000
3% markup for Bonds & Insurance	\$2,614,000	
5% markup for Mob/Demob	\$4,357,000	
8% markup for Contractors Overhead	\$7,529,000	
4% markup for Contractors profit	\$3,765,000	
25% Contingency	\$26,349,000	
Subtotal Markups and Contingency		\$44,614,000
Total Project Construction Costs		\$131,745,000
8% allowance for pipeline engineering and design	10,540,000	
12% allowance for permitting, legal and administration	15,810,000	
8% allowance for pipeline engr services during construction	10,540,000	
Subtotal Other Project Costs		\$36,890,000
GRAND TOTAL PROJECT COST		\$168,635,000
PRESENT WORTH (6%, 20yrs)		\$173,008,000
PRESENT WORTH (6%, 50yrs)		\$174,645,000

Racine - Lake Michigan Direct Return Flow

Pipeline			Waukesha WWTP	794
Segment	Miles	Diameter	elevation at watershed divide	1000
A	37.0	36	Discharge at Lake Michigan	580
			Segment A Piping K	10.35 (one K=1.0 entr, twenty K=0.30 90-elb, 5 open bfly valve K=0.25, one bend thru rdcr tee K=1.80+0.3)
			Segment B Piping K	8.15 (one flow thru tee K=0.6, ten K=0.3 90-elb, one bend thru tee K=1.80, five open bfly valve K=0.25, one exit K=0.5)
			Piping Friction Factor	0.015
			Power cost, \$/kw	0.08
			Power efficiency	0.8
			GHG, lbs CO2/Mwhr	1659

	Supply Flow Rate	Supply Flow Rate	A Pipeline Velocity	A Pipeline Frict Loss	A Piping Misc K Loss	Total FW Piping Fric Loss	Total Static Loss	TDH	TDH	Power	Power	Annual Power Usage	Annual Power Cost	Annual GHG Produced
	mgd	gpm	ft/s	ft	ft	ft	ft	ft	psi	hp	kw	kw	\$	tons CO2
ADD	10	6940	2.19	72.43	0.77	73	206	279	121	700	580	5077904	\$304,674	4720
MDD	14	9716	3.06	141.97	1.51	143	206	350	151	1226	1016	8896858	\$533,812	8270

WWTP Effluent Pump Station

Approx. Topo EL 794

Design TDH 350 ft must be designed to pump up to the watershed divide;
151 psi

No. of pumps 3 3 active, 1 standby

Capacity, mgd (each) 3.33

HP (each) 292 nominal 350 hp

Drive variable frequency

Return Flow Pump Station Capital Cost \$ 3,830,000

Total Annual O&M

Power	\$304,674
Pump O&M	\$ 76,600 (2% of P.S. Capital)
Total Annual O&M	\$381,274



Waukesha Water Utility

SERVING WAUKESHA SINCE 1886

115 DELAFIELD STREET
WAUKESHA, WI 53188-3615

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To: Daniel Duchniak, PE

From: Donna Scholl, MS, CPA

Date: April 21, 2011

Subject: Lake Michigan Water Supply – Impact on Rate Payers

Embodied within this memo is the rate summary that relates to the water supply and return flow alternatives associated with obtaining Lake Michigan water. The accounting conventions underlying the analysis conform to the Uniform System of Accounts for Municipally Owned Water Utilities prescribed by the Public Service Commission (PSC) of Wisconsin, dated January 1, 2008. The assumptions used are consistent with the ones the Utility has used each time it has filed a Conventional Rate Case application with the PSC, however for this analysis the users are assumed to be homogenous and defined as residential due to the fact that the only way to determine costs across the various customer classes is to complete a cost of service rate case with the PSC. Completing the analysis utilizing the residential class as the constant, allows for an equalized comparison of rate impacts for all of the alternatives. Specifically the assumptions are as follows.

The Current Annual Residential User:

- Volume based on 3 Year Average Gallons Billed = 13,477 Gallons/Quarter; 53,908 Gallons/Year
- Residential Rates effective as of April 14, 2011

Projected Annual Costs are Calculated Incrementally and Include:

- Purchased Water
 - Volume Purchased is based on a 3 year average volume pumped (2,482,941,000 gallons per year)
 - Rates:
 - Milwaukee rates = existing Menomonee Falls rates
 - Oak Creek rates = existing Franklin rates
 - Racine rates = existing Caledonia rates
- Pumping Expenses
 - Deep well pump electricity savings
 - New water supply pump station electrical costs
 - Maintenance on new pump structures
- Treatment Costs
 - A decrease in existing water treatment costs obtained by eliminating current water treatment process except for chlorine addition for disinfection purposes
 - A decrease in costs to maintain treatment equipment
- Transmission and Distribution
 - Increased transmission and distribution system operations and maintenance costs
 - Additional return flow operating costs
- Additional Debt Service costs at a total cost of borrow of 6.5% for Revenue Bonds

If the payer base assumes the total obligation for the project (via Revenue Bonds) annual residential users cost will range from \$621.68 to \$1,152.81, depending on the construction alternative chosen.

If the project receives Federal or State monies the following sensitivity analysis projects annual residential user costs will range from \$467.43 to \$1,132.07. The sensitivity analysis relates the nine construction options (three water supply alternatives with three return flow alternatives) to eight different funding scenarios. The analysis assumes the award of Federal grant monies from \$0 million to \$75 million and \$0 to \$40 million in loans over a four year period from each of the State of Wisconsin Safe Drinking Water and Clean Water Funds at their 2011 interest rates. Table 1 reveals that the maximum funding assumed (\$80MM State Loans and \$75MM Federal Grants) yields a savings to the rate payer \$154.24 annually over 100% Revenue Bond Financing within each of the nine alternatives.

As stated previously, this work was performed as a sensitivity analysis. The detailed effects on all classes of payers will be determined after our funding levels and the timing of our borrows is known. I anticipate that several Cost of Services Studies will be performed by the PSC upon the filing of appropriately timed Conventional Rate Case Applications. It will be those cases that will determine the impact on the rates for each of our customer classes.

Table 1

Projected Annual Residential User Costs with State and Federal Financial Assistance

<u>State \$</u> <u>(millions)</u>	<u>Federal \$</u> <u>(millions)</u>	Milwaukee Supply			Oak Creek Supply			Racine Supply		
		1 Return via Lake Michigan	2 Return via Root River	3 Return via Underwood Creek	4 Return via Lake Michigan	5 Return via Root River	6 Return via Underwood Creek	7 Return via Lake Michigan	8 Return via Root River	9 Return via Underwood Creek
0	0	\$718.71	\$657.86	\$621.68	\$951.33	\$890.48	\$854.30	\$1,152.81	\$986.93	\$950.75
0	25	\$674.21	\$613.36	\$577.18	\$906.82	\$845.97	\$809.79	\$1,108.31	\$942.43	\$906.25
0	50	\$629.70	\$568.85	\$532.67	\$862.32	\$801.47	\$765.29	\$1,063.80	\$897.93	\$861.75
0	75	\$585.20	\$524.35	\$488.17	\$817.82	\$756.97	\$720.79	\$1,019.30	\$853.42	\$817.24
80	0	\$697.97	\$637.12	\$600.94	\$930.59	\$869.74	\$833.56	\$1,132.07	\$966.20	\$930.02
80	25	\$653.47	\$592.62	\$556.44	\$886.09	\$825.24	\$789.06	\$1,087.57	\$921.69	\$885.51
80	50	\$608.97	\$548.12	\$511.94	\$841.58	\$780.74	\$744.56	\$1,043.07	\$877.19	\$841.01
80	75	\$564.46	\$503.61	\$467.43	\$797.08	\$736.23	\$700.05	\$998.56	\$832.69	\$796.51

Current Annual User Costs = \$266.41