BEFORE THE ENVIRONMENTAL BOARD OF REVIEW
STATE OF OHIO

CONCERNED CITIZENS OF OTTAWA COUNTY, et al.	:	Case No. EBR 623311-623317 Case No. EBR 623320-623326 Case No. EBR 623374-623380
MAYOR KATHLEEN K. DZIAK AND COUNCIL, VILLAGE OF MARBLEHEAD	:	Case No. EBR 623318 Case No. EBR 623319 Case No. EBR 623373
Appellants	:	
v.	:	
DONALD SCHREGARDUS, DIRECTOR OF ENVIRONMENTAL PROTECTION, ET AL.	:	
Appellee.	:	Issued: September 25, 1996

FINDINGS OF FACT, CONCLUSIONS OF LAW
AND FINAL ORDER

Issued By:

ENVIRONMENTAL BOARD OF REVIEW

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This matter comes before the Environmental Board of Review ("Board" or "EBR") upon a series of appeals[1] brought by the Appellants, Village of Marblehead, Mayor Kathleen K. Dziak, the Village Council of Marblehead, and a group of six citizens, collectively referred to as the Concerned Citizens of Ottawa County ("CCOC"). The first group of appeals relates to the Director of the Ohio Environmental Protection Agency's ("Director" or "OEPA") May 11, 1995 approval of detail design plans for a proposed 6.0 million gallon per day (MGD) public drinking water system to be constructed by the co-Appellee, the Ottawa County Regional Water System ("Ottawa County"). The second group of appeals is a challenge to the Director's May 19, 1995 approval of another set of detail plans for the facility's transmission mains, distribution lines and elevated storage system. The last group of appeals relates to an August 22, 1995 Order of the Director approving revisions to the May 19, 1995 plans with respect to the distribution mains and transmission lines.

On June 22, 1995, Ottawa filed a Motion to Dismiss for Lack of Standing which was denied by the Board after extensive briefing on August 2, 1995. On October 17, 1995, Ottawa County filed a second Motion to Dismiss for Failure to Respond to Discovery. This Motion was denied by the Board on November 1, 1995.

A de novo hearing in this matter was held before the full Board, commencing on February 8, 1996 and concluding on February 15, 1996.

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[1] Although these cases represent the appeals of only three Orders of the Director, it is the Board's practice to docket a separate appeal for each appellant in order to facilitate subsequent partial appeals by less than all of the original parties.

Thereafter, all of the parties filed thorough pre- and post-hearing briefs, as well as Proposed Findings of Fact and Conclusions of Law.

On February 21, 1996, Appellants filed a Motion to Supplement the Hearing Record with documents relating to turbidity in the finished water at the Port Clinton Plant. Appellee Ottawa filed a Response to the Motion on February 27, 1996, in which it did not object to the additional evidence, provided that a counter affidavit attached to its Response be similarly admitted. Accordingly, the Board hereby rules to grant the Motion to Supplement the Hearing Record with the materials submitted by Appellants, as well as the affidavit prepared and filed by Appellee Ottawa.

Appellants were collectively represented by Attorneys Joseph A. Brunetto and Robert H. Maynard of Vorys Sater Seymour and Pease, Columbus, Ohio. The Director was represented by Assistant Attorneys General Joseph P. Koncelik and Margaret A. Malone. Ottawa County was represented by Attorneys Orla E. Collier, III and Terrence M. Fay of Benesch, Friedlander, Coplan and Aronoff, Columbus, Ohio.

Based upon the evidence adduced at the de novo hearing, the certified record filed pursuant to R.C. Section 3745.04, and the pleadings of the parties, the Board makes the following Findings of Fact, Conclusions of Law and Final Order AFFIRMING the orders herein under appeal.

FINDINGS OF FACT

1. Appellant Village of Marblehead ("Marblehead") currently owns and operates a community water supply system which draws its water from Lake Erie at a location to the south and west of the Village of Marblehead. Marblehead

supplies drinking water to its own residents, as well as to portions of Danbury Township, which adjoins Marblehead's western boundary. (Notice of Appeal, Case No. EBR 623318 and Answer of Ottawa County therein.)

2. Appellant CCOC is an unincorporated, voluntary association of owners of residential and commercial real estate in Ottawa County who oppose the construction of the Ottawa County Water System at the Port Clinton site. It is apparent from this and associated litigation in the Ottawa County Probate Court that both Marblehead and CCOC desire that certain unincorporated areas within the County receive drinking water from the existing Marblehead water system. (Id.; Come Sail Away Condominium Association, et al. v. Board of Commissioners of Ottawa County, Case No. 959001A, Ottawa County Probate Court, dec'd. April 22, 1996.)

3. Appellee Ottawa County, by and through its Board of Commissioners, has applied for approval of design plans for the construction of a drinking water system and associated transmission and storage facilities in an established sewer district. This integrated county-owned system would serve Bay, Catawba Island, Erie, Portage and Salem Townships, as well as portions of the unincorporated area of Danbury Township. (Appellees' Exhibit 12.)

4. By way of history, according to the testimony of Jack Jones[2] and Jim Frey[3], Ottawa County, together with Port Clinton, Oak Harbor and Carroll Township, began to explore the possibility of their joint participation in a comprehensive regional water system in Ottawa County in 1993. These entities

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[2] Jack Jones is the president of and a partner in Poggemeyer Design Group, an engineering and design firm which prepared the detail plans for the entire Ottawa County facility.

[3] Jim Frey is the Ottawa County Sanitary Engineer.

jointly contracted with Poggemeyer Design Group ("PDG") to prepare a Master Plan for such a system. (Testimony of Frey; Jones.)

5. The "Ottawa County Regional Water Master Plan" ("Master Plan") that was ultimately developed by PDG provided for the construction of a new water treatment plant in Ottawa County on a new site that could utilize the existing Lake Erie intake currently being used by the City of Port Clinton's drinking water plant. (Testimony of Jones.)

6. Among other things, the Master Plan prepared by PDG presented a comprehensive evaluation of Ottawa County, its economy, topography, geology, land use, existing facilities and population and future water requirements. (Appellees' Exhibit 1.)

7. The Master Plan was eventually submitted to the Director on October 7, 1993. In this first Plan, Carroll Township was included as a participant in the new system. (Appellees' Joint Exhibit 1.)

8. On March 14, 1994, based on the initial submittal and significant additional information requested by the OEPA staff (see discussion, infra), the Director sent correspondence to Ottawa County indicating that the Master Plan appeared to be "technically acceptable." (Appellees' Joint Exhibit 8.)

9. On November 1, 1994, a second set of enhanced and supplemental plans for the drinking water system was submitted to the Director. This submission is referred to as the "General Plan," and included detail plans for the entire facility. (Appellees' Exhibit 12.)

10. Following the submission of the Master Plan, Carroll Township had elected not to proceed with its participation in the system. Consequently, pertinent data was modified in the General Plan to reflect Carroll Township's

withdrawal. (Appellees' Exhibit 12, p. 8; Testimony of Arduini; Jones.)

11. Between the time that OEPA received the General Plan and May 10, 1995, substantial revision and supplementation were made upon the request of the OEPA staff, including the submission of plans and specifications for the transmission mains, distribution lines, and elevated storage facilities. (Testimony of Arduini; Appellees' Exhibit 16, 17 and 20.)

12. On July 18, 1995, the Director received revisions from Ottawa County pertaining to the detail plans for the transmission mains and distribution lines. (Appellees' Exhibit 18.)

13. On May 11, 1995, May 19, 1995, and August 22, 1995, the Director issued orders approving the detail design plans for the treatment plant, the plans for transmission mains, distribution lines, and storage facilities, and modifications to the proposed distribution and transmission system, respectively. (Appellees' Joint Exhibits 20, 22 and 27.)

14. Appellants filed timely appeals of each of the approval orders, in which the following issues were identified:

1. Whether the Director acted reasonably and lawfully when he approved Ottawa County's proposed use of the existing Port Clinton intake vis-a-vis the requirements of the Safe Drinking Water Act and generally accepted standards for the design and equipping of such facilities;

2. Whether the Director acted lawfully and reasonably when he approved a 6.0 MGD initial capacity for the plant, with the potential for phased modular expansion to 18 MGD, in light of applicable generally accepted construction and equipping standards for public drinking water plants;

3. Whether the revised plans for the proposed transmission and distribution system comply with generally accepted standards for the construction and design of drinking water systems.

REQUIREMENTS REGARDING THE RAW WATER SOURCE

15. The construction and installation of public drinking water systems cannot be initiated without obtaining the approval of the Director. Specifically, Revised Code Section 6109.07(A)(1) provides, in part:

> Upon receipt of a proper application, the director shall consider the need for compliance with requirements of the Safe Drinking Water Act, and generally accepted standards for the construction and equipping of water systems, and shall issue an order approving or disapproving the plans. In granting an approval, the Director may stipulate conditions designed to ensure that the systems will be able to meet the requirements of Chapter 6109 of the Revised Code and rules adopted thereunder. R.C. Section 6109.07(A).

16. When reviewing plans for proposed public drinking water systems, therefore, the Director is required to consider (1) the need for compliance with the federal Safe Drinking Water Act, (2) accepted engineering and design standards, and (3) the requirements of state law. [R.C. Section 6109.07(A)(1).]

17. Dr. Ashley Rodrick Bird is the Manager of the Engineering and Operations Section of the Ohio EPA's Division of Drinking and Groundwater. Dr. Bird is also Ohio's representative to the Ten States Standards[4] Committee. He is also involved in policy development on state drinking water issues. (Testimony of Dr. Bird.)

18. Dr. Bird testified that in assessing the need for compliance under the Safe Drinking Water Act, the Director evaluates the system's ability to

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[4] See Findings of Fact Nos. 55 - 60 for a discussion of the implications of the Ten States Standards.

provide treated or "finished" drinking water that complies with state[5] and national standards. The conclusion that the quality of the finished water is the test of compliance with federal and state requirements was echoed by a number of additional witnesses, including the Appellants' witness, Roger Baker[6]. (Testimony of Jones; Matthew Young[7] and Baker.)

19. Both OEPA and the United States Environmental Protection Agency ("U.S. EPA") impose finished water standards. In Ohio, these standards are broken down into two main categories: primary, or federally-imposed standards, and secondary state standards for safe drinking water for public water systems. (Testimony of Jones, Young, Bird and Baker; O.A.C. 3745-81., et seq.)

20. Importantly, there is no state or federal law that imposes any standards on the quality of a raw water source for a water treatment plant. In other words, there is no federal or state standard for the monitoring or testing of raw water quality which must be met in order for a source to be acceptable - - - the focus is more on the "treatability" of the water to

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[5] O.A.C. Section 3745-81, et seq. sets forth primary and secondary standards for drinking water under authority of R.C. Section 6109.04. Specifically, O.A.C. 3745-81-11 sets maximum contaminant levels for finished water; O.A.C. Section 3745-81-13 addresses acceptable turbidity levels; and O.A.C. 3745-81-14 contains standards for microbiological contaminants, including coliform.

[6] Mr. Baker is an engineer, partner, and twenty-five year employee with Jones & Henry Engineers. Jones & Henry specializes in the design of public water and wastewater treatment systems. Mr. Baker has extensive experience in the design of public water facilities, as well as in the education and training of operators of such facilities.

[7] Mr. Young is an engineer with the Columbus-based environmental consulting firm URS Consultants. He has notable experience with the design of public water systems, including the Avon Lake facility which employs Lake Erie as its raw water source.

acceptable levels. (Testimony of Bird, Jones, Young.)

21. Consequently, we find no basis upon which the Director could have required extensive testing of the raw water source prior to plan approval under either state or federal law with respect to drinking water standards. Accordingly, we turn to the issue of the technical ability of the proposed facility to provide finished water that meets applicable drinking water standards.

ABILITY OF THE PROPOSED FACILITY TO MEET APPLICABLE DRINKING WATER STANDARDS.

22. Although the Director did not require extensive testing of the raw water source, he did consider the quality of the Lake Erie water source as it relates to the "treatability" of the source to finished water standards. (Testimony of Dr. Bird.)

23. During the detail plan review, OEPA's initial plan reviewer, Sanjeev Prakash, evaluated the existing information in OEPA files about the quality of the Lake Erie source and the treatability of water at the Port Clinton intake. Mr. Prakash raised questions to his Environmental Supervisor, John Arduini, who then consulted with Dr. Bird about the necessity of gathering additional data concerning raw water quality in the vicinity of the Port Clinton intake. (Testimony of Dr. Bird, Tape 32 and 39; Testimony of Arduini.)

24. In the process of reviewing Ottawa County's Master Plan, both Mr. Arduini and Dr. Bird evaluated the County's proposal to use the existing Port Clinton intake, including an examination of significant historical data

regarding the Port Clinton plant[8] and the range of raw water turbidity expected at the source. (Testimony of Dr. Bird, Tape 32.)

25. The historical information examined by the plan reviewers consisted mainly of monthly operating reports which include information on the physical, chemical, radiological, and microbiological quality of the finished water at Port Clinton. Nearly forty years of finished water quality data is available for the Port Clinton plant. (Id.)

26. Further, both Bird and Jones testified that Lake Erie is the best surface water source available in Ohio in terms of raw water quality. Lake Erie is currently used by approximately twenty public water systems in the state as a raw water source. (Testimony of Bird, Tape 32; Testimony of Jones.)

27. Appellants' witnesses, Roger Baker and Professor Kwang Lee[9], agreed that Lake Erie is a good water source, with Baker admitting at hearing that it is a "given" that Lake Erie is a good source of raw water. (Testimony of Baker; Transcript testimony of Lee.)

28. Raw water sampling taken at the intake location in October, 1993

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[8] In addition to the historical data, the record reveals that Ottawa had performed sampling of the raw water quality at the Port Clinton intake on two separate occasions, and had submitted to the Director finished water test results for the Port Clinton plant for the last two years. Appellants did not provide evidence of any independent testing or evaluation of the raw water quality at Port Clinton.

[9] Dr. Kwang Lee holds a Ph.D. in Civil and Environmental Engineering from Cornell University. He is currently a full professor in the field of water resources and environmental engineering at the University of Wisconsin-Milwaukee. He is a prolific author in his area of expertise, and the recipient of numerous grants, contracts and academic honors. Dr. Lee's testimony was admitted, pursuant to an agreement of counsel, in the form of a transcript of his testimony in prior litigation between Ottawa County and Appellants herein, who were represented by the same counsel as appear on their behalf in this matter.

and October, 1995 by Ottawa demonstrated that, with the exception of total coliform and turbidity, all primary and secondary drinking water requirements under the Safe Drinking Water Act for finished water had been met or exceeded[10]. Dr. Lee acknowledged that raw water quality at the intake generally meets finished water quality standards. (Testimony of Lee; Appellees' Exhibits 4, 31; Testimony of Jones, Young, Lee and Bird.)

29. With regard to turbidity, it is not uncommon for raw-water turbidity levels at Lake Erie to vary from 1 - 1,500 nephelometric turbidity units (NTU). Given this range, the average raw water turbidity of 27 - 30 NTU at the Port Clinton plant is not unusual, and compares favorably with the 5 - 9 NTU average experienced at the Marblehead plant. (Testimony of Jones; Appellants' Exhibit 3.)

30. Further, Port Clinton's finished water turbidity similarly compares favorably with Marblehead's, with Port Clinton's average being lower for 1995. (Testimony of Jones, Young and Bird; Appellants' Exhibits 3, 5; Appellees' Exhibit 37, 67.)

31. Finally, monitoring data for at least the last two years at the Port Clinton facility demonstrates that the average finished water turbidity is well within allowable parameters.[11] (Testimony of Jones, Young and Bird;

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[10] The samples were tested for nitrate, nitrite, total coliform and turbidity, as well as for herbicides, pesticides and trihalomethanes.

[11] On February 21, 1996, following the conclusion of the hearing in this matter, Appellants filed a Motion to Supplement the Hearing Record with information from OEPA indicating that the Port Clinton plant had exceeded average finished water turbidity standards for two days in January, 1996. We admitted this additional evidence into the record, along with Appellees' February 27, 1996 Response, which indicated that the two day exceedance was due to (1) operational problems which necessitated the temporary inactivation of certain equipment in order to replace it, and (2) voluntary hourly testing

Appellees' Exhibit 37.)

32. The Director also made a specific analysis of the ability of the existing intake to provide an adequate quantity of water and to function properly. (See Findings of Fact 70 - 77, infra.)

33. Although Appellants claim that the Portage River may have an effect on the quality of water at the existing Port Clinton intake, this impact has been documented in the historical information related to raw and finished water quality at Port Clinton. Further, there was evidence presented to demonstrate that the Port Clinton plant currently experiences minimal impact from the Portage River. (Testimony of Dr. Bird, Tape 36; Appellees' Exhibit 71.)

34. Based on current flow patterns in the affected areas of Lake Erie described by Dr. Bird, there does not appear to be any location within the Western Reef that is not influenced to some degree by either the Sandusky Bay (including Marblehead's intake) or the Portage River under certain wind conditions. (Testimony of Dr. Bird, Tape 36, Appellees Exhibit 69 and 70.)

35. Appellants presented evidence of several reported outbreaks of waterborne diseases in communities using conventional drinking water systems of the same general design as the plant proposed by Ottawa County. In particular, Appellants identified an outbreak of cryptosporidium[12] in the

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by Port Clinton over the 48-hour period of time for which the floculators were inoperative which caused the average turbidity to rise to a level of a technical violation. We cannot find that this extraordinary circumstance reflects on the day-to-day ability of the Port Clinton plant to meet finished water standards, particularly in light of the more than two-year history of compliance.

[12] Cryptosporidium is a waterborne pathogen which testimony established is present to some degree in almost all waters, including so-

Milwaukee drinking water supply in 1993[13]. (Appellants Exhibits 41 and 42.)

36. Appellees presented evidence to distinguish the Milwaukee situation from the facility proposed by Ottawa County: First, Milwaukee enjoys a population of over 1 million, while Port Clinton's population is closer to 7,000. Second, there is great disparity in the amount and nature of industrial pollution in the Milwaukee area versus the Lake Erie site at issue. (Appellant's Exhibit 27, pp. 66 - 70.)

37. The testimony revealed that pollution in the Milwaukee harbor originates from approximately 40 sources, and the drainage area incorporates approximately 900 square miles. The harbor is deeper than Lake Erie, which tends to slow velocity. The harbor also contains breakwaters which tend to trap effluent from the Milwaukee, Menomonee and Kennickinnic Rivers in the harbor. (Appellants' Exhibit 27, p. 4, 7, 19, 23; Testimony of Bird.)

38. Despite Dr. Lee's impressive credentials, we do not find that the conditions extant at the Milwaukee plant permit a conclusion that the Ottawa County plant will not provide safe drinking water, or that the Lake Erie intake is unacceptable. The testimony revealed that many variables, including wind conditions, current and flow patterns, pollution sources and flow velocities, prohibit the conclusion that what occurred in Milwaukee is likely to occur at the proposed plant. Unlike Milwaukee, none of the various public water systems which use Lake Erie as a water source has experienced an

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called "pristine" waters. Testimony of Bird.

[13] Notably, the source of the cryptosporidium outbreak in Milwaukee has never been conclusively identified. Moreover, it has never been established that the conditions at the Milwaukee plant were the cause of the outbreak. Testimony of Kwang Lee; Appellants' Exhibit 46.

outbreak of cryptosporidium. (Testimony of Dr. Bird, Tape 34.)

39. In addition, at the time of the outbreak, there were indications that the Milwaukee plant was experiencing operational problems with its filtration system. Aside from that operational problem, however, the Milwaukee plant, unlike the proposed Ottawa County plant, was designed to recycle backwash from the filters to the plant, a process which causes cryptosporidium oocysts to become more concentrated within the plant[14]. (Testimony of Dr. Bird, Tape 34.)

40. Finally, the evidence revealed that the Milwaukee plant was subject to now-expired drinking water standards, and that it was operating at a level that would be in violation of current safe drinking water standards at the time of the cryptosporidium outbreak in 1993. Since 1993, there has no reported recurrence of cryptosporidium in Milwaukee's treated water. (Appellants' Exhibit 34; Testimony of Bird; Lee; Appellees' Exhibit 69, p. 66.)

41. Citing raw water turbidity data for Port Clinton, Appellants next contended that there is a high correlation between raw water turbidity and the probability that finished drinking water will be contaminated with cryptosporidium[15] or giardia. This conclusion was based, in part, on

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[14] As an aside, we note that the Ottawa County plant is also designed in a manner which allows either parallel or series operation, a characteristic which permits plant operators to maximize the ability of the facility to treat raw water from the intake. Testimony of Bird, Tape 33.

[15] Interestingly, the evidence revealed that the turbidity levels in the Milwaukee harbor at the time of the cryptosporidium outbreak were relatively lower than those experienced in Lake Erie. Testimony of Byrd.

interpretations of Mark W. LeChevallier's 1991[16] and 1995[17] studies.

42. However, Dr. Bird's interpretation of current data, including LeChevallier's 1995 study and studies conducted in New Jersey and Wisconsin, failed to support a link between raw water turbidity and the presence of viable cryptosporidium in finished water. (Appellant's Exhibit 14; Appellees' Exhibit 69, p. 58; Testimony of Bird.)

43. The evidence more ably supports the conclusion that the operational integrity and capability of a plant is a more relevant gauge of the success of the removal of viable oocysts than the characteristics of the raw water source. (Testimony of Dr. Bird; Appellees' Exhibit 69, at 58.)

44. With regard to these operational requirements, there are currently no state or federal rules in effect which require either monitoring or treatment of cryptosporidium.

45. U.S. EPA has proposed a rule for the collection of information on cryptosporidium, as well as an enhanced water treatment rule. Neither rule had been finalized as of the date of the hearing in this matter since being proposed in 1994. Notably, the proposed enhanced water treatment rule does not set forth a single course of action to address cryptosporidium removal, but rather contains a series of alternatives, ranging from various log-inactivation levels to no change in monitoring requirements. (Appellees'

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[16] As of 1995, Mark W. LeChevallier was the director of research for the American Water Works Service Company, Inc. The 1991 article referred to by Appellants is entitled, *Giardia and Cryptosporidium ssp. in Filtered Drinking Water Supplies*, LeChevallier, Mark W., Norton, William D., and Lee, Ramon G., Applied and Environmental Microbiology, September, 1991.

[17] *Giardia and Cryptosporidium in Raw and Finished Water*, LeChevallier, Mark W., Norton, William D., Journal of the American Water Works Association, September, 1995. Appellees' Exhibit 69.

Exhibits 29 and 30; Testimony of Bird.)

46. Dr. Bird testified that crafting a final federal rule is difficult due to the fact that there is no demonstrated technique with which to test accurately for the presence of viable, infectious cryptosporidium oocysts[18]. Even the 1991 LeChevallier study, relied upon by Appellants, states that the detection of the presence of cryptosporidium oocysts is not conclusive as to their infectiousness. (Testimony of Bird; Appellant's Exhibit 14.)

47. LeChevallier's 1995 study concluded that, despite frequent detection of cryptosporidium in drinking water, microscopic evaluation revealed that nearly all of the organisms were nonviable. Thus, a test for viable cryptosporidium oocysts, undeveloped to date, is important to determine the necessity for and level of removal. (Appellants' Exhibits 14, 34; Testimony of Dr. Bird, Tapes 33, 34; Appellees' Exhibit 69.)

48. Given the status of the literature and dearth of data concerning effective measurement, viability and infectiousness of cryptosporidium oocysts, it is questionable whether the final federal information collection rule will include cryptosporidium monitoring requirements. Testimony of Bird.

49. Aside from the proposed federal rules, there has been an interim, voluntary recommendation developed by regulators for filter performance of .1 NTU per filter with respect to turbidity for removal of cryptosporidium. (Testimony of Dr. Bird, Tape 33, 34.)

50. Dr. Bird ultimately concluded that the Ottawa County plant would be capable of meeting this voluntary recommendation for removal of

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[18] It is only upon painstaking microscopic evaluation that the viability and virulence and, thus, the threat to public health, of oocysts can be even suggested. Testimony of Bird; Appellant's Exhibit 14, p. 2621.

cryptosporidium, as well as the two-three log removal/inactivation range of standards set forth in the proposed federal rule based on the plant's conventional design and disinfection practices alone.[19] (Testimony of Dr. Bird, Tape 34.)

51. Dr. Bird's conclusion as to the operational sufficiency of the proposed plant is supported by LeChevallier's 1991 study which contains the statement that the then-current disinfection practices of the plants studied, albeit a limited database, appeared to be effective for inactivation of cryptosporidium oocysts. Indeed, LeChevallier later concluded in 1995 that many of the systems studied met or exceeded recommended treatment levels to a degree that would allow a reduction in disinfection practices without affecting microbial protection. (Appellants' Exhibit 14, p. 2618; Appellees' Exhibit 69, p. 66.)

52. At the hearing in this matter, Appellant's witness, Baker, concurred with Bird's opinion that both the Port Clinton plant and the proposed Ottawa County plant are capable of meeting all applicable finished water quality standards. (Testimony of Baker.)

53. Ample historical evidence of the finished water quality from the Port Clinton plant provided the foundation for the Director to conclude that the new plant, which, incidentally, would employ a significantly higher level of treatment technology than the Port Clinton plant, would be able to meet the

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[19] Notably, the proposed Ottawa County plant will include a number of features not generally incorporated in so-called conventional public water treatment systems in order to further reduce the risk of infection: pre-treatment basins prior to coagulation, pre-settling and sedimentation, two clarifiers with longer detention times, enhanced filtration, and elimination of filter backwash. (Testimony of Jones, Young.)

requirements of the Safe Drinking Water Act concerning finished water quality. (Testimony of Dr. Bird, Tape 32, 33.)

IMPLICATIONS UNDER THE TEN STATES STANDARDS FOR SELECTION OF A RAW WATER SOURCE

54. There are no provisions in the Ohio Revised Code or the Administrative Code dealing with the technical engineering aspects and design criteria for public water systems.

55. Consequently, when assessing whether water treatment facility plans meet generally accepted standards for the "construction and equipping of" such facilities within the context of R.C. Section 6109.07, the Director commonly uses a document entitled, "The Ten States Standards" (TSS) as an evaluative guide. The Ten States Standards is also referred to within the industry by the more technical title, "Recommended Standards for Water Works." (Testimony of Arduini.)

56. Each engineer that testified at the hearing acknowledged familiarity with the TSS and stated that the TSS serves as the primary engineering guidance document for drinking water plants and associated distribution systems. (Testimony of Young, Roger Baker, Jones.)

57. The TSS is a comprehensive document divided into sections dealing with recommended standards for water works. It is clear that the TSS is not employed strictly or in the same manner as a rule, but is merely referred to by OEPA personnel as a guide. (Testimony of Bird; Jones.)

58. Ohio Administrative Code Section 3745-91-08 expressly provides:

> (A) "Recommended standards for water works," "Great Lakes-Upper Mississippi River Board of State Sanitary

> Engineers," or such other publications as may be prepared by the Ohio environmental protection agency for guidance of designers of public water systems, shall be used as a guide in the technical review of plans submitted under this chapter . . .

59. At hearing, each of the Director's witnesses on the issue testified that the TSS is merely a guide, the suggestions of which may be accepted or rejected on a case-by-case basis. This opinion is echoed in the Foreword of the TSS:

> "The terms shall and must are used where practice is sufficiently standardized to permit specific delineation of requirements or where safeguarding of the public health justifies such definite action. Other terms, such as should, recommended, and preferred, indicate desirable procedures or methods, with deviations subject to individual consideration." (Appellees Joint Exhibits 48, 49 and 65; Appellants' Exhibit 15, pg. ix.)

60. Dr. Bird testified that it is only where the TSS employs the terms "shall" or "must" that the subject requirement is even arguably to be regarded as a generally accepted engineering practice. (Testimony of Bird, Tapes 32 and 33.)

61. Section 3.0 of the TSS, entitled "Source Development" provides:

> In selecting a source of water to be developed, the design engineer must prove to the satisfaction of the reviewing authority that an adequate quantity of water will be available, and that the water which is to be delivered to the consumers will meet the current requirements of the reviewing authority with respect to microbiological, physical, chemical and radiological qualities. Each water supply should take its water from the best available source which is economically reasonable and technically possible. (Appellees' Exhibit 65.)

62. More specifically with regard to the quality of a source to be

developed, the TSS provides at Section 3.1.2:

> A sanitary survey and study shall be made of the factors, both natural and man made, which may affect quality. Such survey and study shall include, but not be limited to
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> a. determining possible future uses of impoundments or reservoirs,
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> b. determining degree of control of watershed by owners,
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> c. assessing degree of hazard to the supply by accidental spillage of materials that may be toxic, harmful or detrimental to treatment processes,
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> d. obtaining samples over a sufficient period of time to assess the microbiological, physical, chemical and radiological characteristics of the water,
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> e. assessing the capability of the proposed treatment process to reduce contaminants to applicable standards,
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> f. consideration of currents, wind and ice conditions, and the effect of confluencing streams. (Id.)

63. Contrary to Appellants' assertions, Dr. Bird testified that the Director would not apply these provisions of the TSS to require a design engineer to demonstrate, through extensive additional testing, surveys and evaluation, the acceptability of a raw water intake that was already proven to be adequate and approved for use. (Testimony of Bird.)

64. In essence, the Director makes a distinction between public water systems which propose to use an existing and proven raw water source and those which contemplate the use of an entirely new source. A new source is one from

which a public water supply has not been previously drawn, or an existing source for which a relocated or new intake is proposed. (Testimony of Dr. Bird, Tape 32.)

65. As Dr. Bird testified, testing of raw water is an adequate way to determine potential treatability in the distinguishable situation where there is an absence of other data. Consequently, it is the OEPA's position that the portion of the TSS relating to source development, Part 3.1.2(d), should not be construed to require redundant testing of an existing and proven raw water source. (Testimony of Bird, Tape 33.)

66. In this case, the proposed intake had been approved by the Ohio Department of Health in 1958. Thus, the Director had access to nearly forty years of data for the Port Clinton plant. (Testimony of Bird, Tape 32; Appellees' Exhibit 36.)

67. The Director determined that the extensive historical data generally satisfied the purpose of the TSS source development requirements, thereby obviating the need for additional study of the Lake Erie source. (Testimony of Dr. Bird, Tape 32.)

68. With regard to the treatability of the raw water to finished water standards, there was ample testimony that the forty years of available data, coupled with Port Clinton's monthly operating reports, demonstrated that the proposed raw water source, in most instances, already complied with finished water standards; that even the technologically outdated Port Clinton plant is capable of treating the raw water to acceptable microbiological,

physical, chemical and radiological parameters referenced in the TSS[20]; and that the effect of the Portage River on raw water quality is a known quantity, minimized by prevailing northeasterly wind conditions. (Testimony of Jones, Dr. Bird, Baker and Young; Appellees' Exhibits, 4, 31 - 35, and 68; Testimony of Dr. Bird, Tape 32.)

69. Under the facts of this case, we find no basis to diverge from the Director's reasoned interpretation that the portion of the TSS relating to the development and testing of a new source does not apply to existing and proven sources of raw water.

70. Aside from the issue of the source selection which the Director deemed inapplicable to this situation, the applicable section of the TSS additionally suggests that there be an adequate quantity of water. (Appellees' Exhibit 65; Section 3.1.1 of the Ten States Standards.)

71. While it appears obvious that Lake Erie is adequate in terms of the volume of water available, the Director made a specific evaluation of the ability of the intake to function adequately in light of the capacity of the proposed public water system. (Testimony of Bird; Testimony of Jones; Appellees' Exhibit 36, 65; Appellants' Exhibit 2.)

72. The existing Port Clinton intake, which would be used initially by the Ottawa County plant, was built in 1958 and approved under the former jurisdiction of the Ohio Department of Health. The crib is located 900 feet to the north of an old crib, and includes a 32 foot square timber platform. Although in operation for over 40 years, 96% of the 30" reinforced intake pipe

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[20] Appellee Ottawa County presented evidence that the Port Clinton plant was capable of treating to finished water turbidity standards even during a raw water turbidity spike of 429 NTU.

has less than 6" of silt build-up. Two breaks were observed via a recent inspection commissioned by PDG. One has been repaired, and the other is located 425 feet out from the intake. Up to 15" of silt has accumulated at the latter site. (Appellees' Exhibit 5, 36.)

73. Overall, PDG has characterized the condition of the intake as "excellent," with a useful life of 80 years without renovation and a value of $1.428 million. Minor repairs and silt removal are estimated at $138,000. The depreciated value of the intake was set at $803,750.00. (Appellees' Exhibit 5.)

74. Given the overall sound condition and value of the Port Clinton intake, coupled with the fact that there are negligible differences in raw water quality at test points throughout this portion of Lake Erie[21], PDG concluded that there was no advantage in locating the intake at another location. (Appellees' Exhibit 4, p. 2.)

75. However, use of the existing intake initially would save the system's participants at least $1.4 million in construction and related costs. (Id.)

76. Appellants' position that the TSS requires that the Director

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[21] On October 6, 1993, Appellees took samples of Lake Erie raw water at four different locations: Camp Perry, Catawba Island, Port Clinton and Marblehead. The results revealed that there were negligible differences in the levels of nitrate, nitrite, total coliform, turbidity, herbicides, pesticides and trihalomethanes. Although we acknowledge that a one-day testing event is unusual, the witnesses were generally in agreement that the new plant, with its enhanced technology and operational flexibility, will be fully able to meet all finished water parameters at the Port Clinton intake location. (Appellees' Exhibit 4; Testimony of Bird, Jones, Baker.)

consider relocating the plant to Marblehead[22] or Catawba is not supported by the Director's view of the TSS as a guide. For purposes of argument, however, the relatively consistent raw water quality in Port Clinton, Catawba Island and Marblehead, the undisputed technical capability of the new plant to meet finished water standards, the favorable geographic location of the Port Clinton intake, and the cost-savings inherent in using the existing pipeline and crib, together provide the basis for the Director to conclude that the Ottawa County facility is both "economically reasonable and technically possible.[23]"

77. The Director's evaluation of the intake was based upon the 1959 plan approval for the intake issued by the Ohio Department of Health, which documented most of the design specifics of the Port Clinton intake. The Director ultimately concluded that the intake was sized large enough to accommodate the proposed 6.0 MGD initial construction, and could adequately service up to a 10.0 MGD plant, or through the first phase of modular expansion. (Testimony of Bird; Appellees' Exhibit 36, 65; Appellants' Exhibit 2.)

78. Despite Appellants suggestions to the contrary, Dr. Bird testified

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[22] The negligible differences in water quality in these areas for nitrate, nitrite, coliform and turbidity are reflected on Appellees' Exhibit 4.

[23] In 1992, Mr. Baker's firm prepared a Preliminary Design Report for Ottawa County, signed by Mr. Baker, in which he concluded that the Ottawa County plant should be located in the Port Clinton area, as close as possible to the existing intake and raw water pump station. (Appellees' Exhibit 38, p. 27.)

that it was unlikely that frazil ice[24] would clog the intake or impede the flow of an adequate supply of water. Dr. Bird indicated that his evaluation of the 1959 approval of the intake by the Ohio Department of Health revealed that the wood composition of the intake would minimize frazil ice concerns. (Testimony of Bird.)

79. Finally, both Bird and Jones agreed that, although inapplicable to an existing source, the TSS's recommended velocity limitations would be satisfied by the existing intake. (TSS Section 3.1.4(c); Testimony of Bird; Jones.)

80. Based on the Director's evaluation and testimony, we find no reason to question the adequacy of the quantity of water from the proposed Lake Erie source, or the ability of the existing intake to function in an acceptable manner vis-a-vis the capacity of the proposed public water system.

DESIGN CAPACITY OF THE PROPOSED SYSTEM

81. The proposed Ottawa County System will serve Bay, Catawba Island, Danbury, Erie, Portage and Salem Townships in an established sewer district in Ottawa County. The City of Port Clinton and the Village of Oak Harbor, as well as the County, will participate in the water system. (Appellees' Exhibit 12.)

82. The approved detail plans call for the construction of a $61

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[24] In most basic terms, "frazil ice" is the formation of needle-like or other obstructive crystals within an intake which experiences turbulent water flow. Frazil ice can eventually impede the volume of water which an intake can accommodate.

million surface water treatment and transmission system with a proposed initial capacity of 6.0 MGD. The facility is expandable to 18 MGD in increments of 3 MGD construction phases through the design year of 2010. The final design calls for a conventional state-of-the-art water treatment plant with pre-treatment chemical addition, rapid mix flocculation, settling/clarification, filtration, disinfection and finished water storage. There is lagoon storage for filter backwash, as well as a 5 million gallon storage capacity, 1 million gallons of which is in elevated storage. The transmission system is designed to include 12", 16" and 24" mains, with a range of 65 to 85 psi. (Appellee's Exhibit 12, p. 22; Appellees' Exhibit 1, p. 53-54.)

83. Concerning drinking water plant capacity, Section 2.1 of the TSS provides limited guidance:

> ". . . the system including the water source and treatment facilities shall be designed for maximum day demand at the design year." (Appellees' Joint Exhibit 53.)

84. The Master Plan prepared by PDG was based on permanent and seasonal demographic data from the 1990 census, and contained various projections for water usage for both commercial and residential properties. The evidence revealed that Ottawa County is unique in that water consumption is greatly affected by significant seasonal variations in permanent and tourist population. Although Ottawa County is primarily agricultural, it is heavily dependent on tourism and seasonal recreation. There is a significant number of motels, hotels, trailer camps, summer cottages and condominiums that contribute to high variations in water demand. (Appellees' Exhibit 1, p. 2.)

85. In assessing the design capacity for the proposed plant, PDG set about determining the "peak day demand" for the new plant. In layman's terms, this figure represents the highest water demand which can be expected in any single day within a particular year. (Testimony of Arduini, Baker, and Edward Bischoff.)

86. Peak day demand is determined based upon a number of factors, one of which is the average daily demand. Average daily demand is based, in part, on the amount of water consumed per day by individuals and other types of industrial and recreational users. (Testimony of Arduini and Jones.)

87. In the Plan, PDG devised a figure of 67 gallons per capita per day (gpcd) in determining initial usage. This figure was then multiplied by the total permanent and seasonal population to obtain what is termed, the "average daily use." The average daily use was then increased by usage data that called for a 10% allowance for line losses and a 29% factor for commercial, industrial and recreational usage. (Testimony of Jones; Appellees' Exhibit 1.)

88. Thus, using the 67 gpcd estimate and a peak ratio of 2.0, peak day demand was calculated as follows: Total and permanent seasonal population (1990) x 67 gallons per capita per day, plus commercial/industrial/recreational usage and line losses, x a peak factor of 2.0[25]. [(Total population x 67) + (C+I+R+loss allowance) x 2 = peak day demand]. (Id.)

89. For the incorporated areas within the proposed service area, the

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[25] The peak factor of 2.0 times the average daily demand was based on a survey of historical peaks at the existing Port Clinton plant. The 2.0 factor is conservative, given testimony that a range of 1.5 to 2.0 times initial average daily demand could be justified in determining the peak factor. (Appellees' Joint Exhibit 38; Testimony of John Arduini.)

Master Plan provided actual 1990 metered use which confirmed that the PDG formula projections approximated actual usage figures. (Appellees' Joint Exhibit 1, pg. 51.)

90. To determine the peak day demand for the large unincorporated areas of the proposed service area for which there is currently no public water and no meter usage data, PDG used a figure of 60% of the peak day demand. The 60% figure was used to account for a gradual "tap-in" rate in the unincorporated areas, based on PDG's conclusion that assessments for the system would discourage initial tap-ins and limit demand in the first few years of operation. With respect to the tap-in rate, PDG was also of the opinion that relatively few of the seasonal population would elect to initially tap-in. (Appellees' Exhibit 1, p. 14; Appellees Joint Exhibit 1; Testimony of Jones and Arduini.)

91. Notably, Appellants' expert did not disagree with the 60% initial tap-in rate estimate. (Testimony of Roger Baker.)

92. Based on all of these calculations, PDG recommended sizing the treatment plant and transmission system to meet the ultimate goal of a maximum 18 million gallons per day (MGD) demand through the year 2010.[26]

93. Appellant's witness, Roger Baker, testified that where there is no metered usage data available, it is reasonable from a design standpoint to consider population and current and projected development trends when

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[26] The year 2010 is what is termed the "design year" for the proposed facility. It is a design goal that water supply projects of this magnitude and expense be a reliable source for anticipated water usage for a period extending at least through the design year. The design year for each project is determined by the Director on a case-by-case basis. (Testimony of John Arduini.)

determining the water demands and sizing of the facility. (Testimony of Baker.)

94. To address economic concerns founded on the seasonal variations in population and usage, PDG proposed that the plant be constructed in phases, with an initial plant capacity of 6.0 MGD, and the capability of modular expansion in increments of 3.0 MGD to the 18 MGD design limit. (Testimony of Jones; Appellees' Exhibit 1, p. 49.)

95. Mr. Arduini initially questioned the 67 gpcd figure in assessing initial plant capacity in a December 2, 1993 letter to Ottawa County. In that correspondence, Mr. Arduini questioned the above-described formula with respect to average daily use, the 60% tap-in estimate, and the ability of the proposed phased expansion to accommodate demand in the design year. (Appellees' Joint Exhibit 6.)

96. On February 21, 1994, Ottawa County sent a response to Mr. Arduini, in which it explained the basis for its usage calculations, and demonstrated to the satisfaction of Mr. Arduini that its average daily use figure was conservative when compared to available actual usage figures. (Appellees' Joint Exhibit 7; Testimony of Arduini.)

97. Specifically, PDG compared its average daily use calculations to actual usage figures for the incorporated areas of the county for 1990. Not only did PDG's projections approximate those available for actual use, in all cases the projections were more conservative[27] than the actual usage figures. (Appellees' Exhibit 7; Testimony of Arduini.)

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[27] The more conservative the projection for demand, the more allowance there is for growth in population and average daily use.

98. At the hearing, Mr. Arduini testified that he was satisfied with the documentation provided by PDG to support a 67 gpcd. (Testimony of Arduini.)

99. Not only did Appellants fail to provide the Board with any evidence to dispute the 67 gpcd, an earlier report prepared by Appellants's expert Baker for the Village of Marblehead in a competing proposal employed a smaller usage figure of 60 gpcd. (Testimony of Arduini; Appellees' Exhibit 63, p. 4.)

100. Ottawa further explained that if the 60% tap-in proved too low, a phased expansion could be initiated sooner than expected. (Appellees' Exhibit 7.)

101. With regard to the overall concept of phased or modular expansion, PDG cited economic considerations which rendered one-time construction of a twenty-year plant impractical in an area so significantly impacted by seasonal population. PDG also indicated that it believed a twenty year projection impractical based on the high growth and seasonal uncertainties inherent in the area, stating, "in a high growth area, and in an area impacted by tourism and recreational activity, twenty year projections are less practical than five or ten year projections [for demand]." (Appellees' Exhibit 7, p. 2.)

102. Appellants' expert, Ed Bischoff, a civil engineer and president of the engineering consulting firm, Bischoff & Associates, testified that modular expansion is an acceptable means of minimizing costs and meeting demand over time. Dr. Baker echoed this assessment of phased expansion in both his testimony and in a 1993 Master Plan he had prepared for the Village of Marblehead. (Testimony of Bischoff and Baker; Appellees Exhibit 57, p. 38.)

103. At the hearing, Mr. Arduini testified that Section 2.1 of the TSS is satisfied when a plant is designed for phased or modular expansion which will ultimately meet future peak day demand in the design year. Mr. Arduini testified that this phased, or modular, approach to meeting peak day demands at the design year is acceptable where adequate justification exists. (Testimony of Arduini.)

104. Mr. Arduini testified that the receipt of these additional justifications concerning initial capacity and expansion satisfied him that the plant was capable of meeting demand. (Testimony of Arduini.)

105. After independent confirmation of PDG's calculations, OEPA deemed the Master Plan "technically acceptable" in a letter dated March 14, 1994. (Appellees' Exhibit 8.)

106. Significantly, Mr. Arduini testified that the Director's determination that the Master Plan was technically acceptable related only to the use of formulas to project future demand, and the concept of phased or modular expansion. (Testimony of Arduini.)

107. Mr. Arduini indicated that, at the time of the approval of the technical feasibility of the Master Plan, the capacity numbers would not have been acceptable to OEPA. Specifically, Mr. Arduini explained that the projected initial peak day demand would exceed the initial plant capacity of 6.0 MGD, if the plans or service area did not change. (Testimony of Arduini.)

108. On November 1, 1994, a second set of plans for the treatment system and associated transmission and distribution lines was received by the Director. This submission was referred to as the "General Plan," and included detail plans for the entire facility. (Appellees' Exhibit 12.)

109. The General Plan also included a proposed initial plant capacity of 6.0 MGD. However, Carroll Township had elected in the meantime not to proceed with its participation in the system. Consequently, the service area had decreased, and expected initial peak daily demand was reduced by over 400,000 MGD. (Appellees' Exhibit 12, p. 8; Testimony of Arduini.)

110. Although the expected initial daily demand still exceeded the plant capacity by approximately 14,000 MGD, Mr. Arduini testified that this difference is insignificant due to the practice within the industry of rounding down numbers less than 100,000 gallons. (Appellees Exhibit 12, p. 14; Testimony of Arduini.)

111. Mr. Arduini identified a number of additional factors that rendered the initial 6.0 MGD acceptable. First, Mr. Arduini testified, and Appellants' expert agreed, that seasonal peaks within the service area would not occur simultaneously. (Testimony of Arduini, Jones and Baker.)

112. Second, Mr. Arduini cited the overall conservative nature of the Agency's ratings for design capacity, and the conservative peak factor of 2.0[28] in support of the 6.0 MGD figure. (Testimony of Arduini.)

113. Finally, Mr. Arduini testified that the use of modern treatment technology at the proposed facility could permit an increase in the rated capacity of the system without any physical change to the treatment structures. (Testimony of Arduini.)

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[28] Because acceptable peak factors range from 1.5 to 2.0, a peak factor of 2.0 provides a significant cushion in terms of system design. In fact, even the less conservative peak factor of 1.64 employed by Appellant's expert, Roger Baker in his Port Clinton study, resulted in higher estimated peak usages for 1995 than were documented with actual usage figures. (Testimony of Arduini; Appellees' Exhibit 38.)

114. The Board did not find Appellants' evidence that the plant is underdesigned persuasive. We find PDG's calculations based on actual peak demand by political subdivision and consideration of documented losses of bulk water sales sufficient to rebut Appellants' expert's assertion that the 6.0 MGD initial design is inadequate. (Testimony of Jones.)

115. As pointed out by Appellees, Appellants' expert's calculations, (1) significantly exceeded actual peak usage data available for the years 1992 through 1995[29]; (2) were based on incomplete data for 1995[30]; and (3) included a peak factor (2.0) that appeared to ignore actual usage figures for 1995 which support a lower peak demand ratio of 1.29 to 1.56.[31] (Testimony of Arduini; Testimony of Jones.)

116. In sum, we find that the Director had a valid factual foundation on which to base his conclusion that the plant was adequately designed and sized to meet the statutory requirements.

ADEQUACY OF THE TRANSMISSION AND DISTRIBUTION SYSTEM WITH RESPECT TO THE TEN STATES STANDARDS AND APPLICABLE DRINKING WATER LAW

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[29] Mr. Baker calculated a peak demand of 3.203 MGD for Port Clinton and Oak Harbor alone. The actual peak demand for these areas in 1995 was 2.03 MGD.

[30] More precisely, Mr. Baker's calculations ignored usage data for November and December, 1995. Historical data establishes that these two months experience average flow rates that are significantly lower than what can be expected in the summer months. Consequently, Baker's calculations for average use for all of 1995 based on the first ten months of the year were skewed. (Testimony of Baker; Appellees Joint Exhibit 41, p.2.)

[31] In fact, Mr. Baker had previously prepared a report in which it was indicated that the highest peak factor ever experienced at the Port Clinton plant was 1.64. (Appellees' Exhibit 38, p. 6.)

117. In the Notices of Appeal, Appellants alleged that the distribution system associated with the new drinking water plant will not meet the TSS requirements. Specifically, Appellants contend (1) the fire hydrants are not appropriately spaced and (2) that there is an inadequate "cushion" between the water transmission lines and the sewer lines. (Notice of Appeal.)

118. With regard to the TSS sections applicable to fire hydrant spacing, Section 8.3.1 provides:

> Hydrants should be provided at each street intersection and at intermediate points between intersections as recommended by the State Insurance Services Office. Generally, hydrant spacing may range from 350 to 600 feet depending on the area being served.

119. Ziad Musallam, a Sanitary Survey Inspector and the Detail Plan Reviewer for the Ottawa County project, testified that the Director interprets the use of the directory terms "should" and "may" in Section 8.3.1 of the TSS as providing guidance or suggestions, rather than mandating certain spacing requirements. (Testimony of Ziad Musallam.)

120. In addition, Mr. Musallam testified that the Director has no authority to require a county or township to install fire protection. (Id.)

121. With regard to state drinking water standards, we are unable to find a nexus between the installation and spacing of hydrants and the quality of the drinking water supplied to potential customers.

122. Appellees' Joint Exhibits 44 and 45 depict hydrant spacing throughout the four service areas. In some remote, sparsely populated areas, the hydrants are situated up to 2000 feet apart, requiring that each hydrant service a 1000 foot radius. (Appellees' Joint Exhibit 44 and 45.)

123. In the vast majority of cases, however, populated areas reflect hydrant spacing much closer than the 1000 foot radius. In many cases, conjoined circles on Exhibit 45 indicate that the service area of the hydrants in populated areas significantly overlap. (Appellees' Exhibit 45.)

124. There was testimony from Mr. Jones that the Ohio State Insurance Office provides that hydrant spacing may be up to 1000 feet from a property before any disadvantage in insurance rates attaches. (Testimony of Jones.)

125. In this case, the County's cost of installing the hydrants will be reimbursed by the townships. The affected townships have approved the spacing provided in the General Plan. (Testimony of Frey and Jones; Appellees' Exhibit 46.)

126. To summarize Musallam's testimony, it is the Director's opinion that the directory nature of the TSS and the latitude afforded based on the "area being served" language rendered the hydrant spacing approvable. In addition, Musallam pointed out the fact that the affected townships were satisfied with hydrant location, and this also played a role in his conclusion that the hydrant spacing was approvable. (Testimony of Musallam.)

127. Appellants' second concern with the transmission and distribution system was that there were seven (7) instances in which there were allegedly inadequate spacing between the new drinking water transmission lines and the existing sewer lines. (Testimony of Baker; Certified Record Items: Contract A, Sheet 75; Contract A, Sheet 60; Contract A, Sheet 59; Contract A, Sheet 22; Contract B, Sheet 55; Contract B, Sheet 58; and Contract B, Sheet 71.)

128. In support of this claim, CCOC cites Section 8.6.4 of the TSS which states:

> Water mains shall be laid at least 10 feet horizontally from any existing or proposed sewer. The distance shall be measured edge to edge. In cases where it is not practical to maintain a ten foot separation, the reviewing authority may allow deviations on a case-by-case basis, if supported by data from the design engineer. Such deviation may allow installation of the water main closer to a sewer, provided that the water main is laid in a separate trench or on an undisturbed earth shelf located on one side of the sewer at such an elevation that the bottom of the water main is at least 18 inches above the top of the sewer.

129. With regard to the variances permitted in Section 8.6.2, Section 8.6.4 of the TSS provides:

> The reviewing authority must specifically approve any variance from the requirements of Sections 8.6.2 and 8.6.3 when it is impossible to obtain the specified separation distances.

130. In most cases, PDG's design for the distribution system complied with the recommended separation. In certain areas, however, there is no dispute that the ten foot recommended horizontal distance had not been met in the design plan filed on November 1, 1994. (Testimony of Jones, Baker and Arduini.)

131. Consequently, Musallam met with PDG representatives to discuss each point at which there appeared to be inadequate separation as identified by Musallam after extensive review of the General Plan. (Testimony of Mussallam.)

132. In each instance, Musallam testified that the engineers either agreed to move the affected water line to meet the recommended cushion, or supplied adequate explanations of the reasons it was impractical to meet the separation. (Testimony of Musallam.)

133. Following this meeting, the plans for the transmission and distribution system were revised and resubmitted to the Director for his review. It is in these revised plans that the seven spacing areas in dispute remain. (Testimony of Musallam; Jones; Baker.)

134. Musallam testified that the Director interprets the applicable section of the TSS to apply to sanitary rather than storm sewers. Consequently, it is the Director's position that drinking water lines may be located within ten feet of a storm sewer. (Testimony of Musallam.)

135. In three of the cases identified by Appellant where the 10 foot separation has not been maintained, the subject sewer was a storm rather than a sanitary sewer, and the Director approved the spacing based upon his interpretation of the TSS. (Testimony of Musallam.)

136. In the four remaining situations, the evidence suggests that the Director granted a variance from the 10 foot spacing guidance based upon specific information received from the design engineer.

137. For example, Musallam testified that he was satisfied that the proximity of summer cottages to the roadways and associated sewer lines rendered a ten foot separation difficult, if not impossible, in some cases. (Testimony of Musallam.)

138. There was also testimony presented that the location of large trees and bedrock, as well as narrow easements and existing utilities rendered ten foot spacing impractical in other areas. (Testimony of Jones, Musallam.)

139. In each of the four instances in which a deviation was permitted where sanitary sewers were involved, there was evidence that compliance with the suggested separation would involve extensive destruction of pavement,

relocation of gas lines, relocation of a force main or interruption of water service. (Testimony of Jones and Musallam.)

140. In some instances where Musallam believed that a deviation was warranted, he made notes on the design plans. PDG also noted the location of some deviations on the final design plans. (Testimony of Musallam; Jones.)

141. The evidence revealed that approximately 8% of the total distribution system reflect deviations, several of which are less than two feet. (Testimony of Jones, Musallam.)

142. In all cases, the trenching and vertical spacing recommendations discussed in the last sentence of Section 8.6.2 of the TSS were met. (Testimony of Jones and Musallam.)

143. We are not persuaded by Appellants claims that the seven instances in which deviations were permitted are true variances addressed under R.C. Section 3745.01 which require individual, journalized actions of the Director. Here, the Director permitted deviations on general plans, and the deviations are evident on the face of the plans.[32] (See Certified Record Items identified in Finding of Fact No. 127.)

144. On August 22, 1995, the Director approved the plans for the transmission and distribution system based on the information exchanged between PDG representatives and Musallam, and the revised locations of certain water lines on the General Plan. (Appellees' Exhibit 27.)

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[32] We note that the detail plans contain precise information about the location and extent of deviations from the TSS guidance. The plans indicate the locations of public and private roadways, existing utilities, easements, rights of way, and natural and man-made obstructions.

CONCLUSIONS OF LAW

1. In determining a de novo appeal, the Board must decide whether or not the Director's actions that are under appeal were unreasonable or unlawful. (R.C. Section 3745.05.)

2. "Unlawful" means that the action is contrary to applicable law. "Unreasonable" means that the action is not in accordance with reason or that it has no factual basis. It is only where the Board can properly find from the evidence presented at the hearing that there is no valid factual foundation for the Director's action that the action in question can be found to be unreasonable. [Citizens Committee to Preserve Lake Logan v. Williams, 56 Ohio App. 2d 61, 381 N.E. 2d 661 (Franklin County, 1977).]

3. Conversely, where the evidence adduced at hearing and otherwise properly admitted, indicates that the action taken by the Director is both lawful and reasonable, the Board must affirm the action. (Id., at 69 - 70.)

4. This Board is not confined to the record certified by the Director, but may consider additional evidence presented at the hearing. [Northeast Ohio Regional Sewer District v. Shank, 58 Ohio St. 3d 16, 567 N.E. 2d 993 (1991); O.A.C. 3746-7-01(D).]

5. As long as there is a reasonable factual foundation for the action, the Board may not substitute its judgment for that of the Director. (Id., at 69 - 70.)

6. The burden of proof in this matter is upon Ottawa County as the permit applicant. (Jackson County Environmental Committee v. Shank, Case Nos. 91 AP-57, -58 (Franklin Cty. App.), dec'd. December 10, 1991; Johnson's Island Property Owners Association v. Schregardus, Case Nos. 94 APH10-1441 - 1446,

94APH101472 - 1477, (Franklin Cty. App.) dec'd. June 15, 1995.)

7. Consistent with Jackson County Environmental Committee, supra, and Johson's Island Property Owners' Association, supra, and without objection from the parties, the Board also assigned the burden of proceeding upon Ottawa County.

8. Upon Ottawa County's submission of design plans for the proposed public water system as required by R.C. Section 6109.07(A), the Director was required to "consider the need for compliance with requirements of the Safe drinking Water Act, and generally accepted standards for the construction and equipping of water systems, and shall issue an order approving or disapproving the plans." [R. C. Section 6109.07(A)(1).]

9. The Director must also ensure that the system will be capable of meeting the state drinking water requirements contained in R.C. Chapter 6109 and the rules adopted thereunder. [R.C. 6109.07(A)(1).]

10. In determining whether a proposed public water system will meet generally accepted standards for the construction and equipping of water systems, the Director may rely on the TSS as a guide.

11. Ohio Administrative Code Section 3745-91-08(A)[33], the preamble to the TSS, and substantial testimony from the Director's witnesses are adequate to support the Director's interpretation of the TSS as a guidance document rather than one imposing mandatory, generalized requirements.

12. Where the Director is charged with the implementation of the public water system statute, the Board will show deference to his

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[33] This provision of the Ohio Administrative Code is set out in pertinent part at Finding of Fact No. 58.

interpretation regarding the extent of the applicability TSS, as well as to his construction of applicable statutes and rules. State ex rel. Brown v. Dayton Malleable, Inc., 1 Ohio St. 3d 151, 155, 438 N.E. 2d. 120, 123 (1982); Jones Metal Products Co. v. Walker, 29 Ohio St. 2d 173, 181, 281 N.E. 2d 1, 8 (1972). In short, the Director is afforded broad discretion in the use of the TSS during plan evaluation.

13. The Director's failure to impose mandatory requirements based on recommendations in the TSS does not provide the basis for overturning an otherwise lawful plan approval.

14. We find, based on the evidence accepted in the record of this matter, that Ottawa County has met its burden of proving that the proposed Ottawa County plant complies with the federal Safe Drinking Water Act and with the generally accepted standards for the construction and equipping of public water systems. The evidence establishes that the proposed facility will be capable of meeting all finished water requirements imposed under state and federal law.

15. The evidence further supports the conclusion that the 6.0 MGD initial construction, with phased increments of 3.0 MGD to a total design capacity of 18.0 MGD, approved by the Director, is lawful and reasonable.

16. Finally, we find the record adequate to support our concurrence in the Director's finding that the design and placement of the transmission and distribution system is adequate to meet all applicable requirements.

17. In sum, the Board concludes that the actions of the Director under appeal herein are lawful and reasonable.

FINAL ORDER

For all of the foregoing reasons, the Board hereby AFFIRMS the action of the Director in the appeal herein.

The Board, in accordance with Section 3745.06 of the Revised Code and Ohio Administrative Code 3746-13-01, informs the parties that:

> Any party adversely affected by an order of the Environmental Board of Review may appeal to the Court of Appeals of Franklin County, or, if the appeal arises from an alleged violation of a law or regulation to the court of appeals of the district in which the violation was alleged to have occurred. Any party desiring to so appeal shall file with the Board a Notice of Appeal designating the order appealed from. A copy of such notice shall also be filed by the Appellant with the court, and a copy shall be sent by certified mail to the Director of Environmental Protection. Such notices shall be filed and mailed within thirty days after the date upon which Appellant received notice from the Board by certified mail of the making of an order appealed from. No appeal bond shall be required to make an appeal effective.

THE ENVIRONMENTAL BOARD OF REVIEW

Toni E. Mulrane, Chairman

Mary Kay Finn, Vice-Chairman

Jerry Hammond, Member

Entered into the Journal of
the Board this 25th
day of September, 1996.

COPIES SENT TO:

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HUBERT KEATING	[CERTIFIED MAIL]
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VILLAGE OF MARBLEHEAD	[CERTIFIED MAIL]
DONALD SCHREGARDUS, DIRECTOR	[CERTIFIED MAIL]
OTTAWA COUNTY REGIONAL WATER SYSTEM	[CERTIFIED MAIL]
Joseph A. Brunetto, Esq.	
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Margaret A. Malone, Esq.	

FINDINGS OF FACT,
CONCLUSIONS OF LAW
AND FINAL ORDER
Case No. EBR 623311, ETC.

CERTIFICATION

I hereby certify that the foregoing is a true and accurate copy of the FINDINGS OF FACT, CONCLUSIONS OF LAW AND FINAL ORDER in CONCERNED CITIZENS OF OTTAWA COUNTY, ET AL., MAYOR KATHLEEN K. DZIAK AND COUNCIL, VILLAGE OF MARBLEHEAD V. DONALD SCHREGARDUS, DIRECTOR OF ENVIRONMENTAL PROTECTION, ET AL., Case No. EBR 623311-623317, 6233320-623326, 623374-623380, 623318, 623319 and 623373 entered into the Journal of the Board this 25th day of September, 1996.

Mary J. Oxley

Mary J. Oxley, Executive Secretary

Dated this 25th day of
September, 1996, at Columbus, Ohio.