

Visual Quality Testimony in an Adversary Setting¹

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Abstract: This paper documents the conditions, procedures, techniques and conclusions under which a utility was required to replace two-thirds of a mile segment of overhead 69 kv transmission line passing an Ice Age National Scientific Reserve with underground at the cost of \$950,000 vs. \$60,000 for overhead (WPSC 1978). Because the proposed right-of-way would not, in this case, create deleterious impact to other aspects of the environment, e.g., soil erosion, vegetation removal, etc.; therefore, the sole issue became whether the overhead transmission line would deleteriously alter the visual quality of the Reserve. The paper focuses upon the authors' experience as expert witnesses in this adversary setting and provides specific insights into how the case was developed, presented and sustained. The primary purpose of this paper is to share this experience with others who are concerned with the visual resource.

BACKGROUND

The results and conclusions reached by the Wisconsin Public Service Commission (PSCW) proved to be of value to those concerned with the visual resource. During the preparation of the case, we were unable to find published relevant material from which to assist us. The intent of this paper is to share our experience, the techniques we employed, plus reasons for our approach with those of you who may be in similar situations.

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CONDITIONS SURROUNDING THE CASE

The construction of a 69 kv transmission line in contrast to larger transmission lines, e.g., 345 kv, is typically not a controversial locational item. Nor, would it normally be expected that a facility of this type would attract institutional, legal and professional interest. This was not the situation in this PSCW case. The reasons for the interest in this case are important because they establish a set of opportunistic conditions for a test of the importance of visual quality. The test being - under what conditions would the PSCW commissioners be willing to rule for or against construction of a transmission facility solely on visual quality issues?

The following conditions were present. First, we as professionals, were asked by an attorney representing a private land owner to visit the site. We responded to two questions.

One, if construction of the 69 kv line were to be completed, could there be a deleterious visual impact to the Cross Plains segment of the Reserve? Second, was the PSCW staff in error by not requiring an environmental impact statement because the Wisconsin Environment Policy Act (WEPA) requires a two-step evaluation? The first step requires the agency staff to determine if a more comprehensive environmental impact statement is necessary. In this case the PSCW staff determined that an environmental impact statement was not necessary.

Second, the institutional and political conditions within the PSCW appeared to be supportive of a test case. The PSCW chairman is a nationally-known energy economist recognized for his innovative use of economics in resource related issues plus he had conducted research on economics in relation to environmental values. Third, two competent, aggressive, and committed attorneys were involved. Previous experiences in adversary settings had proven to be extremely counter-productive when the authors had been involved or represented by inferior and non-involved counsel.

The adjacent land owner was represented by a tax attorney who typically represents settlement cases. The citizens of the State of Wisconsin were represented by the Public Intervenor, which is a public supported office. The responsibility of the office is to intervene when the citizens' rights to environmental quality are not being represented by the Department of Natural Resources. Before becoming the Public Intervenor, he was an aggressive criminal lawyer in the Attorney General's office. Fourth, the geological uniqueness of the site would make the case for visual quality more straightforward. From a geological point of view the site is unique (Black). Fifth, our previous experiences in developing weighted, descriptive and hierarchical transmission location models show that an array of experts concur that unique natural features should be avoided (Murray and Tsao 1973, Murray and Niemann 1974, Niemann 1973). The results of the three studies indicate that there is considerable agreement that for visual quality reasons unique natural areas should be avoided. All of these studies have documented the following: 1) avoid areas of recognized national importance, 2) avoid scientific areas, 3) avoid significant scenic views, 4) avoid unique archeological and historic features, 5) avoid scenic roads, 6) avoid ridge lines, 7) avoid unique topographic features, and 8) avoid unique geological formations. Also, because one of the studies had involved the utility proposing the construction of the 69 kv transmission facility, it seemed appropriate to determine that the previous conclusions would be admissible and

prevail in an adversary setting. Sixth, there were additional conditions which made this a compelling situation. The PSCW staff had erred, in our judgment, in not requiring an environmental impact statement. This, therefore, made the conclusions and recommendations for non-undergrounding suspect. The utility had chosen a highly visible site (the highest point in the region) for the substation which was eventually shown to be insensitive to overall visual concerns. In addition, it was generally concluded that the utility had chosen their route only after being threatened with legal action. It was not their preferred route. Neither the utility nor the PSCW had asked the Department of Natural Resources (DNR) (who manage the Reserve) for their opinion concerning the proposed 69 kv transmission facility. Also, the employee responsible for overall planning of the Reserve system in Wisconsin was not allowed by his superior to speak out on this issue. This constraint for basically political reasons suppressed public discussion of this visual quality question.

CONDITIONS OF THE SITE

The Reserve was created in May 1974 (National Park Service July 1973). The enacting legislation provided for a joint planning, management, and ownership arrangement between the National Park Service (NPS) and the DNR. The nine reserve sites were selected to represent different results caused by the glacial period in Wisconsin. The Cross Plains unit is an 160-acre site that includes a unique gorge which was created by melt water from the melting glacial ice. The regional condition makes the site unique. The site is located on the interface between the unglaciated (driftless) and glaciated landscape. The site is elevated and provides views of both the glaciated and non-glaciated landscape.

The master plan calls for a self-guiding interpretive center and trails. The trails are intended to guide the visitor to the internal plus external glaciation features. The master plan calls for the interpretive center to be located on the top of the site. DNR was unable to purchase this site and politically did not want to ask the state legislature for permission to use its condemnation authority. This will require development of the interpretive center in a different location. The location would be visually much closer to the proposed 69 kv transmission line. This becomes an important issue in the case.

PROCEDURE

Objectives of the Overall Procedure

In this section we will describe the procedure and techniques we employed and the overall objectives. Four objectives were utilized to assist and guide the development of the case materials. They are as follows:

Defensible--The materials and techniques employed had to be able to withstand cross-examination. The techniques and resultant materials could not be construed as biased, arbitrary, or irrelevant.

Factual--The data presented had to be factual. Interpretations and expert opinion had to be clearly identified and limited to the findings portion of the case.

Self-Descriptive and Logical in Progression--The case materials had to be developed and organized in such a way that the contents lead the reviewer logically through the materials in a self-describing format. We assumed that the PSCW staff, the utilities, and the PSCW commissioners would review the materials in detail in private. Because the materials laid the foundation for our eventual findings as expert witnesses, we developed the materials to assist the self-reviewer to understand the basis for our conclusions.

Illustrative--In addition to being self-descriptive and logical, the materials needed to be illustrative as much as possible to stimulate the before and after conditions of the 69 kv transmission facility. The utilities were inadvertently quite helpful in assisting us simulate the before and after conditions. As soon as we knew we were going to be involved, we photographed the site. The utility was quite sure they would eventually be allowed to construct the facility, so they proceeded to construct the facility. We then again photographed the site. The presence of structures provided us with real and not simulated before and after conditions. Five guidelines were utilized in preparing the case materials. The presentation graphics were: visually communicative, flexible, interrelatable, attractive, and concise. These objectives were incorporated into the exhibit materials represented in figure 1.

We now list the variables selected and the reasons for their selection. Figure 2 illustrates the dimensions of the Reserve, the difference between authorized and actual public ownership and the proposed transmission alignment. Areas within the dashed line are presently owned by DNR. Figure 2 also serves

as a factual base for illustrating the following features.

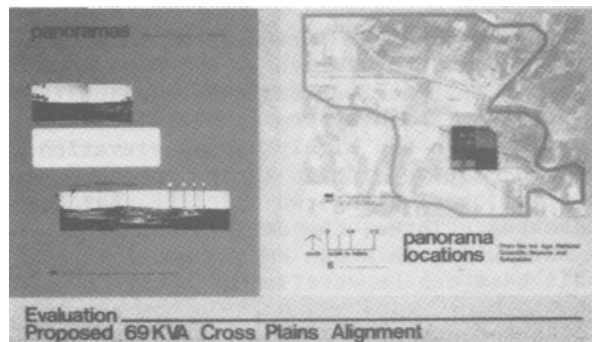


Figure 1-- Panel Exhibit

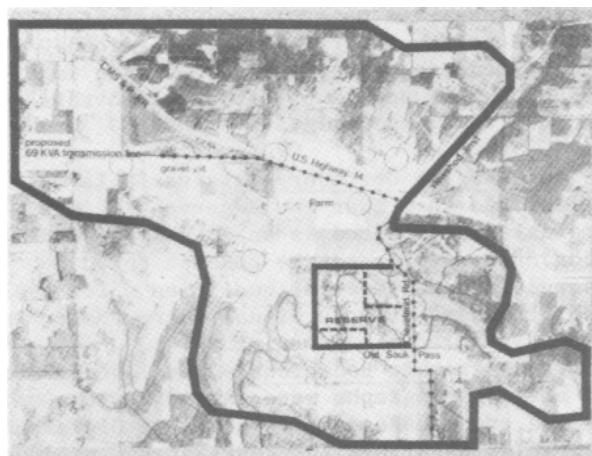


Figure 2-- Photographic Base Map

Viewshed--(see fig. 2). Because one of the primary functions of the site is to provide views of the glaciated and non-glaciated landscape, it was important to document factually the extent that it is possible to view both landscapes from the site (heaviest line).

Proposed and Existing 69 kv Transmission Route--(see fig. 2). The inclusion of all existing 69 kv systems (line with dots) is important to document the extent and the distances from which these facilities can be seen from the site.

Associated Landscape Features--(see fig. 2). Relevant associated features were identified such as adjacent land uses. These were indicated to document our familiarity with the site.

Topography--The portrayal of this variable was important for three reasons. One, it documents that the substation, to which the 69 kv transmission system connects, is located on a prominent and highly visual elevation. Two, the Reserve site is located on a prominent elevation overlooking two distinct geologic landscapes. Three, the delineation of the viewshed which is shown on the photographic mosaic base can be verified if desired.

Land Ownership--This variable was included for three reasons. One, it was used to verify that DNR owned only portions of the totally authorized area. Two, it was used to document overall ownership patterns. Three, it was used to document that, as expert witnesses, we were aware of the private litigant's property holdings. We anticipated that the utility would attempt to cloud or discredit our objectivity as expert witnesses by implying that the adjacent land owner was only looking out after his own long-term potential development interests and not necessarily the public good. As anticipated, the utility did raise the implication. We responded by referring to this document.

Open-Space Corridor--This variable was included to show that the Reserve site was originally designated as an open-space corridor. It reinforced the concept that the Reserve site had special qualities which could possibly be altered by visual intrusions.

Photographic Locations--A series of before and after photographs were taken from the Reserve, to the Reserve, plus along Cleveland Road which parallels the route of the proposed 69 kv transmission line. The location and direction of each photograph was recorded. If the photograph was used in the quantitative change analysis it was so noted. We anticipated that the objectivity and representativeness of the photograph would be questioned. This proved to be true. The inclusion of this plate was quite important in illustrating the representativeness of the photography.

Panorama Locations--To assist further in illustrating the photographic coverage, the panorama photographs were noted. This variable was included to document the location of the scene and cone of visual coverage of each panorama. In addition, with the use of other overlay variables, the type of landscape elements which are visible in the panorama could be verified.

View Locations with Comments--At this point in the case the type of information changes. The preceding material was straightforward and did not require professional or expert witness interpretation. The materials which follow do. This set of materials includes the before and after photographs taken from the site with comments. The comments are our reactions, as experts, to visual change resulting from the proposed 69 kv transmission line. The comments were also used to verify again what features were visible from the Reserve.

Quantitative Changes--This variable was used to document and verify the type and quantity of landscape elements which are presently visible and the type and quantity of landscape elements potentially visible after the construction of the proposed 69 kv transmission line (Murray 1973). The results of this analysis indicate that construction of the proposed 69 kv transmission line would introduce new visual elements to the landscape. From our experience, it is important to document clearly that visual change will occur. How visually perceptible the change will be or what effect the change will have are separate questions. What is presented for hearing record is that change will, in fact, occur. A non-verified theory was utilized. A "cobweb theory" was developed and applied to measure visual change, the assumption being that the combination of conductors created a "cobweb" effect between the viewer and the scene; the net visual change therefore being equal to the distance between the top and the bottom conductor. The utility attorney argued to the contrary which was that the net visual change was only equal to the net perceptual diameter of the conductor itself.

Photographic Sequence Along Cleveland Road with Comments--Cleveland Road is important because it will serve as the entrance road to the interpretive center and the visitor parking lot.

Proposed Tour Route: Effect of Utility System Traveling North with Comments--This material was included because the interpretive tour route is an official part of the master plan. Travel along the Interpretive Tour Route

is potentially affected by the 69 kv transmission line itself and by the connecting substation. For example, emanating from the substation is a series of distribution lines. These distribution lines parallel the Interpretive Tour Route and associated glacial features observable from the route.

Techniques Employed

Discussions were included in the previous two subsections about the source and content of the base materials. What follows is a discussion of the techniques which were employed to insure that the base materials would be accepted as relevant material. As separate techniques they are not that unusual, but as a composite group they represent the array of techniques which were needed in this adversary setting. The following techniques were employed:

Site Visit--Familiarity with the site was essential. For example, the PSCW staff had never visited the site even though it was in close proximity to their office. In addition, the utilities' attorney was not familiar with the unique qualities of the site. More familiarity with the site proved to be of considerable advantage - particularly of a psychological advantage when the expert lacks experience in an adversary setting.

Logical Sequence of Base Materials--The use of overlays and a common set of scales plus a pre-ordered sequence proved to be very helpful. Knowing that the material was self-guiding provided a psychological lift during the more intense periods.

Graphic/Overlay Procedure--To assist in the conveyance of the content of the base materials, various graphic and overlay techniques were employed. Also the base materials were self-contained and displayable on a mounted panel. All photographs were securely mounted on panels therefore requiring others to review the materials in the relationship with the testimony.

Random Photography--Because we anticipated the utilities' attorney would question the representativeness and objectivity of our photography, we employed a random photographic procedure along Cleveland Road. The technique employed consisted of segmenting the road into 100 foot segments. Numbered coins representing 10 foot intervals were used to assign randomly the photographic location within each 100 foot segment. Our concern over non-biased photography proved to be very important. For example, as anticipated, the utilities' attorney asserted that the photography was purposely taken to portray only the negative aspects of

of the 69 kv transmission line. In addition, the attorney argued that "artists' license" was used to accentuate further the negative aspects. Because we anticipated this form of cross-examination, we were able to respond effectively. It was essential for us to prevail at this point in the testimony. The photographs were an essential part of the case. If they had been discredited, our case would have been severely hampered.

Before and After Photography--Because we were able actually to photograph before and after conditions, the task of simulating the 69 kv transmission line was quite easy. The importance of representative simulation cannot be underestimated in an adversary setting.

Quantitative Measurement of Change--This technique consisted of projecting a 35 mm slide upon a grid. The technique was patterned after that developed by Murray (Murray 1970). Within each square, the presence of man-made features was measured in percent. This procedure was conducted for selected before and after photographs. The accumulated cell differences between the before photograph and the after photograph equal the quantitative measurement of change.

Documentation--Again, to ensure that our base materials would be admissible, we very carefully documented their origins and currency. All maps were documented as to origin, date and original and actual scale. The location and direction of all photographs were maintained. The type of film, type of camera, type of film processing, type of lens, characteristics of the lens, time of day, and the date of the year were also recorded.

Experience and the Adversary Mentality--The experiences that we have had indicate quite clearly that anticipation, preparation, documentation and a sort of "gamesmanship" are important factors. The adversary setting in which the primary goal of the adversary is to discredit you as an expert is painful. It is particularly painful to the uninitiated who tend to react as if the cross examination is meant personally. In law classes the "art of selecting and using an expert witness" is discussed and taught. Unfortunately, the education of design professionals is void of preparation in the art and science of being an expert witness. Success in these adversary settings is important. It is professionally important to perform well to ensure that your client has been represented effectively. Quite simply, success builds a reputation and credentials as an expert which lawyers and the courts consider fundamental.

Rehearsal--Some form of "dress rehearsal" in which you and your lawyer develop the questions upon which you will give your testimony is essential. In addition, the lawyer can assist by asking questions expected during the cross examination from the adversary and you can assist the lawyer by developing questions to be asked of the adversaries' witnesses. Since most lawyers will have had no prior experience in visual quality contested cases, you will be expected (most likely) to provide the basic strategy. Be aware of other cases which are relevant and be familiar with the related body of knowledge. The expectations of an expert witness are just what the term implies - an expert.

Utility Insensitive to Public Interest

The quality of the views from the Interpretive Tour Route to the pro-glacial lakes and the unglaciated landscape were adversely affected by the poles and lines.

The substation was located on the highest elevation in the area near the Reserve resulting in a visible and incongruous visual object.

The utility proposed erecting 69 kv lines adjacent to the Reserve creating a situation deleterious to the visual quality of the Reserve.

The utility had constructed a 69 kv transmission line in the background adjacent to highway 14 creating a visual condition that is deleterious to the visual quality of the Reserve.

Utility Did Not Consider Alternate Routes

The location of a substation does strongly influence the route selected for a transmission line. In this case there were several alternate routes that would have avoided the Reserve.

PSCW Staff Should Have Required an Environmental Impact Statement

The project was evaluated by the PSCW staff utilizing this procedure and in the word of a PSCW staff member, it was concluded that "...the overall difference in impacts between routes is not environmentally significant." (PSCW 1977, p. 5).

This conclusion, by PSCW staff, in our opinion was not justified on the face of the evidence provided.

Lack of PSCW Competence in Visual Resource Evaluation

In our judgment, the PSCW lacks educational background and competence in visual quality assessment.

Utilities Ignored Previous Research Findings

The information was known, and, presumably understood by the utility, but staff members chose to ignore the information when locating the transmission line adjacent to the Reserve.

RECOMMENDATIONS

From the analysis we carried out, the following recommendation was given (PSCW 1977, p. 95-96):

Relocate or underground the proposed 69 kv transmission facility from where the Reserve is first visible from Cleveland Road (traveling south) to where the vegetation begins to mask the proposed transmission facility. The northerly burial point must be predicated upon the location of the interpretive center and the views from the potential interpretive hiking trails within the Reserve. This assures the DNR essential flexibility in determining the most representative and educational hiking trail experience for the visitor. This also provides essential flexibility in determining the location of the interpretive center.

EPILOGUE

Commission Ruling

The findings of the PSCW commissioners were written in a document entitled FINDINGS OF FACT AND ORDER (PSCW, 1978), an excerpt from that document contains the following statements:

The commission finds that because of the special unique geological features of the Cross Plains Unit, its special significance at national, state and local levels to the public in the appreciation and understanding of the Ice Age, and the expected extensive use of the Cross Plains Unit by the public in furthering its knowledge of the Ice Age in Wisconsin, the Cross Plains Unit is particularly important from a public interest standpoint. The commission fully understands the relatively high cost of underground versus overhead construction and that

underground construction will have some relatively small impact on rates paid by customers of Wisconsin Power and Light Company. Nevertheless, the commission considers that in this particular case the public interest supports a requirement for underground construction in the vicinity of the Cross Plains Reserve Unit.

The commission will accordingly herein require that Wisconsin Power and Light Company utilize underground instead of overhead construction... .

This determination is not considered to be precedent setting in terms of future transmission line projects, but rather one which reflects the uniqueness and importance of the Cross Plains Unit and the stated, significant public interest considerations involved.

As to the precedential issues, one commissioner dissented.

My decision is based on a test of balancing these interests (economic vs. environment) in a manner consistent with the overall general public interest which I feel requires undergrounding, considering the uniqueness of the Reserve. There is precedential value in this decision. (PSCW 1978, p. 16.)

One PSCW commissioner reflected his overall attitude in the following poem (PSCW 1978, p. 14):

Would the valleys were your
streets, and the green paths your
alleys, that you might seek one an-
other through vineyards, and come
with the fragrance of the earth in
your garments.

The Prophet, Kahlil Gibran

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