

1/19/70

Memorandum 70-7

Subject: Suggested New Topic (Compliance With Water Quality Standards)

The attached letter is from Carl H. Strandberg, who desires to be retained as a research consultant on the topic described in his letter.

We would need to request legislative authority to study this topic if the Commission determines that it is a topic suitable for Commission study and is a topic that merits study now.

Respectfully submitted,

John H. DeMouilly  
Executive Secretary

Memo 70-7

Carl H. Strandberg  
Captain U.S. Marine Corps (Ret.)

EXHIBIT I

*Aerial Reconnaissance Consultant*

*Member, California Water  
Pollution Control Association*

*Member, Swedish Pioneer  
Historical Society*

14 January 1970

Mr. John De Mouilly, Executive Secretary  
California Law Revision Commission  
Stanford University  
Stanford, California 94305

Dear Mr. De Mouilly:

It was a pleasure talking to you on 12 January, 1970, and as agreed a copy of the second edition of my 35mm Aerial Photo-for Measurement Analysis Presentation is being forwarded to you under separate cover.

As discussed, a section on the use of aerial photography as evidence in courts of law appears on pages 58 and 59. These data are, to my knowledge, the only guidelines of presentation of such imagery in courts.

I have had discussions with Mr. Kerry Mulligan, Chairman of the Water Quality Control Board and with Mr. Murry Stein, Assistant Commissioner for Enforcement, Federal Water Pollution Control Administration. These gentlemen agree that aerial photography provides special value when vast areas must be appreciated by the court or when features and/or conditions must be seen from above to be appreciated. These conditions might be critical in measuring compliance with or violation of water quality standards.

If we are to conquer water pollution problems nationally, technology must be developed so that legally enforceable evaluations can be made using remote sensor data. There are more than 3,000,000 miles of flowing streams in the United States and thousands of lakes (11,528 larger than five acres in Minnesota, for example). Our very strength as a nation depends on maintaining the quality of this aquatic wealth. The scope of this problem is so huge that millions of people would be required on the ground to make the kinds of tests and measurements which can be made in just a fraction of the time at but a fraction of the cost using remote aerial sensors. Much of the technology which we need has not been developed yet, but it will be in time. In President Nixon's address before the United Nations he pointed out that the EROS satellite will permit world wide monitoring of water quality. When this capability is proven technologically feasible, I feel that the legal means must be available to support the technological discoveries.

Photography is only one element in the field of aerial remote sensing. Much of the data which will be acted on may consist of imagery and other sensory records which are non-photographic, having been collected using elaborate electronic instruments. Some of these instruments can measure biological activity, electrical resistance or conductivity, liquid density, color, temperature, odor, surface tension, and a variety of conditions which may provide clues of the quality of the water below an outfall, for example. Much of these data cannot be collected using ground (or water surface) techniques because of the remote, isolated locations in which significant data must be collected. Further, since the bodies of water which must be evaluated are always in motion, the dynamic conditions must be stabilized so that they can be evaluated.

As a case in point, I am, as we discussed, a Director of the Alameda County Water District. We have a vigorous ground water recharge program. We depend on a gravity recharge system which includes several percolation pits into which water is pumped (after purchase from the California Water Project and piped in via the South Bay Aquaduct). This water is allowed to soak into the ground. Gravel quarrying is permitted in the area along Alameda Creek, under use permits granted by the City of Fremont. Our District monitors the quality of the water in the pits. These use permits specify that silt and related fine sediments will not be permitted to enter the pits because these substances will plug up the 'pores' between the stones in the gravel, blocking recharge. The permits also state that nothing will be done to impair the quality or quantity of the water.

In a flight over the pits on 30 December 1969, I observed and photographed one of the quarry operators pumping muddy water into the pits, and an oil slick on the surface of another pit. The latter condition appeared to be caused by gasoline or some similar light oil. Strict limitations exist on the amounts these substances which can be tolerated on or in water which is destined for human consumption. Evidence of violations indicated in this way has never, to my knowledge, been tested or accepted in courts of law, and I feel that it should be.

I urge that I be retained by the California Law Revision Commission to define the terms of reference which must be considered in this field. Given a small Grant or contract, I am sure that I could advise the scope and extent of what must be considered to ensure compliance with California's water quality standards.

I am looking forward to hearing from you.

Sincerely yours,

cc: Mr. Kerry Mulligan, Chairman  
Water Quality Control Board  
Room 1140 Resources Building  
9th and O Streets  
Sacramento, California 95814


  
CAPT. CARL H. STRANDBERG USMC (RET)  
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EXHIBIT II

EXTRACT

from

pages 58-60

35-mm AERIAL PHOTOGRAPHY FOR MEASUREMENT-ANALYSIS-PRESENTATION (by  
Carl H. Strandberg)

4.12 35-mm Aerial Photography in Court

Aerial photograph which is to be used as evidence in a court of law in water supply and pollution control litigation will vary depending upon the nature of the violation and upon the laws of the State. However, the general types of pictures which may prove valuable include:

- (1) Pictures of the stream or other area in which contaminating wastes are being discharged.
- (2) Pictures which illustrate the damage resulting from the discharge of a contaminating substance, such as a resulting fish kill.
- (3) Pictures which prove the identity of the person or persons committing the violation.

Aerial photography offers special advantages as evidence in proving some types of water supply and pollution control laws, because pictures from an aerial vantage point can illustrate many conditions which cannot be seen from the ground. Since, fortunately, most conditions resulting from the discharge of wastes into flowing streams change very rapidly, aerial photographs can "freeze" conditions, providing a permanent record of what has occurred. Further, the ground or water areas which are affected may be very large and quite inaccessible. Properly taken aerial photographs can be used to "transport the scene of the crime" into the court room.

Evidence photographs may be divided into two categories: first, those which picture objects and/or areas, and which serve in place of a verbal description of the area; second, those which are designed to prove a point bearing on the case, such as resulting damage.

Photography is usually considered admissible provided that it is an accurate representation of conditions which are in themselves admissible in court. The admissibility of a specific photograph is judged on the basis of the point which is to be proved, and how effectively it accomplishes this purpose. The presiding judge determines whether or not the photograph is admissible as evidence.

Photography which is to be offered in evidence is usually prepared in two forms: first, duplicate individual prints which are to be hand held by each of the jurors, the prosecuting attorney, the defense counsel, and the judge; and, second, a large display exhibit for use by the expert witness in explaining to the court in general the various parts of the subject matter to be discussed.

Individual prints which are to be distributed should be enlarged so that the points to be proven are clearly visible, yet not so much that the significant imagery is degraded by rendition of the clusters of silver grains which form the photographic imagery.

The 8-by-10-inch matte-dried glossy prints serve very well for this purpose.

If large single prints are to be used as part of the expert witnesses' support presentation, the degree of enlargement should be such that significant specific images have a diameter of at least 1 inch for each 25 feet of viewing distance. For instance, if a picture of an outfall is to be shown in court, and the jury is to be seated 50 feet from the point of presentation, the image of the outfall should be at least 2 inches in diameter. An enlargement of 20 by 30 inches in size, neatly fastened to a plywood or masonite backing, makes a good display.

Slide projectors can normally be used in a court of law. The rear-projection procedures which were covered as an analysis technique are well suited for this purpose, because lights, at most, need to be only moderately dimmed.

Color slides are also usually admissible, if color itself is significant to the case, or if it aids in explaining a point.

If the color itself is significant, the court will probably require that verification be made that the color is a fair and correct representation. Slight or inconsequential variations might affect the weight, but not the admissibility of the color picture.