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In The  
**Supreme Court of the United States**

October Term 1984

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No. 27, Original

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THE STATE OF OHIO,

*Plaintiff,*

v.

THE COMMONWEALTH OF KENTUCKY,

*Defendant.*

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**REPORT OF SPECIAL MASTER**

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ROBERT VAN PELT,  
Senior U.S. District Judge  
Special Master



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## INTRODUCTION

This action (No. 27, Original) was filed by the State of Ohio to determine the boundary between the State of Ohio and the Commonwealth of Kentucky. Your Special Master, who shortly prior to the death of the Honorable Philip Foreman, was appointed to succeed him as Special Master, filed a report covering the issues submitted to him. Exceptions, taken by the Commonwealth of Kentucky, were argued December 3, 1979. The case was decided January 21, 1980. *See Ohio v. Kentucky*, 444 U.S. 335 (1980).

Justice Blackmun delivered the opinion of the Court in which Burger, Chief Justice, and Justices Brennan, Stewart, Marshall, and Stevens joined. Justice Powell filed a dissenting opinion in which Justices White and Rehnquist joined.

Your Special Master wishes especially to commend counsel for the State and for the Commonwealth for their professional conduct in cooperating with one another to resolve matters so that this litigation could be tried in as efficient and as prompt a manner as was possible. It is fitting that the evidence jointly presented at a hearing before the Special Master has provided a solution to this controversy which has existed for nearly 200 years.

It is believed that this will be the final report of your Special Master as to the boundary location. There will be a later report dealing with finances, surveying costs, etc. which, it is now expected, will be approved by counsel before filing.

This is the third report of your Special Master in this case. The second report involved a Petition to Intervene filed by Dorothy Cole and others. 454 U.S. 1076 (1981). It was referred to your Special Master who recommended denial. See Special Master's Report Number Two of March 19, 1982. The report was adopted and intervention was denied. 456 U.S. 958 (1982), reh. den. 457 U.S. 1141

(1982). The intervention report and the Order of this Court thereon have nothing to do with the boundary determination proposed in this report.

It is set forth here because it explains a part of the delay which has occurred since the reference to the Special Master and counsel of the preparing of an appropriate decree.

### THE FACTS

The facts as outlined in the Opinion authored by Mr. Justice Blackmun will not be repeated in this report. The effect of the Opinion was to approve the report of the Special Master and establish the common boundary between the State and the Commonwealth as being the north shore of the Ohio River, at low water mark, as it existed in 1792 as nearly as it can now be ascertained.

The Special Master recommends that this Court determine that the boundary between Ohio and Kentucky "is the low-water mark on the northerly side of the Ohio River as it existed in the year 1792"; that the boundary "is not the low-water mark on the northerly side of the Ohio River as it exists today"; and that such boundary, "as nearly as it can now be ascertained, be determined either a) by agreement of the parties, if reasonably possible, or b) by joint survey agreed upon by the parties," or, in the absence of such an agreement or survey, after hearings conducted by the Special Master and the submission by him to this Court of proposed findings and conclusions. Report of Special Master 16.

We agree with the Special Master.

444 U.S. 336-337.

. . . The report is hereby adopted, and the case is remanded to the Special Master so that with the cooperation of the parties he may prepare and submit to the Court an appropriate form of decree.

444 U.S. 341.

Following the filing of the Opinion of this Court, there was considerable correspondence between the parties, in-

cluding correspondence with the Special Master. Your Special Master had concluded, as is later discussed, that agreement could not be reached as to the boundary or to any joint survey of it, as the Court had suggested, and that a hearing would be necessary. The case was set for trial to begin in July, 1981.

In the meantime, your Special Master had been asked by the Commonwealth to determine before trial of the consolidated cases the burden and quantum of proof in each case. In No. 27, Original, Ohio was the plaintiff and Kentucky was the defendant. In the other case, the Commonwealth was plaintiff and Indiana was defendant. Your Special Master, by a Memorandum dated and filed December 10, 1980, concluded that were it not for the Commonwealth's position raising the difficulty of ascertaining the boundary and its continued insistence that the boundary may be some other place than the low water mark in 1792, as nearly as it can now be determined, that it might have been reasonably possible to settle the boundary issue by negotiation and conference. Your Special Master concluded not to decide the matters relating to burden of proof and quantum of proof before the hearing and introduction of evidence. Your Special Master ruled that a trial would proceed in both cases and that Kentucky should be assigned the burden of going forward. Thus, Kentucky would proceed first with its evidence as it related to the boundary between Kentucky and Ohio, No. 27, Original, and then proceed with its evidence relating to the boundary between Kentucky and Indiana, No. 81, Original. That thereafter the State of Ohio, followed by the State of Indiana, would proceed with the introduction of the evidence of each State and that rebuttal by the Commonwealth of Kentucky would then follow. Your Special Master, in his report on the exact location of the boundary would then decide the law as to the burden and quantum of proof if such decision was then needed. Your Special Master concluded his Opinion by referring to the



language found in the last paragraph of the majority opinion that the Special Master “with the cooperation of the parties,” prepare and submit to the Court an appropriate form of decree.

As has been above indicated, discussion continued between the parties, their attorneys and experts. There was also discussion between the respective staffs of the Governors of the States and of the Commonwealth as to legislative sessions and enactments, if any, needed to approve a settlement. Later, on October 20, 1981, at the request of the parties, the trial set for that date was continued. It was ultimately agreed that this case and No. 81, Original, *The Commonwealth of Kentucky v. The State of Indiana, et al.*, would be consolidated and tried at the Federal Courthouse in Cincinnati, Ohio, beginning October 27, 1983.

The parties early had determined as a matter of their mutual convenience in both cases that Cincinnati was the place for the holding of all hearings, rather than alternating the hearings from state to state or capitol to capitol.

During this discussion period, this Court in *Texas v. New Mexico*, decided June 17, 1983, said:

Time and again we have counselled States engaged in litigation with one another before this Court that their dispute “is one more likely to be wisely solved by co-operative study and by conference and mutual concession on the part of the representatives of the States which are vitally interested than by proceedings in any court however constituted.” Cited cases omitted.

462 U.S. 554.

Just prior to the October 20, 1981, trial date above mentioned, counsel for the parties informed the Special Master that they had agreed upon a method of identifying the 1792 low water mark consistent with the dictates of this Court’s January 21, 1980, Opinion. At the opening of the October 20, 1981, hearing, the parties outlined the mechanics involved in preparing topographic maps to be jointly

presented as evidence of the low water boundary line. These maps were to be compiled by the United States Geological Survey, 562 National Center, Reston, Virginia 22090, as outlined in Commonwealth's Exhibit No. 1, filed with the Clerk of this Court as a part of this report. The exhibit, as the index of exhibits made a part of the appendix attached to this report will show, is the joint letter of counsel for the parties outlining the surveying to be accomplished in No. 27, Original. The maps were to be jointly presented as evidence at a later hearing, which was approved by the Special Master. There have been excusable delays in completing this work. This process involved atypical survey work performed by the United States Geological Survey with their topographic maps that in turn were prepared from the more typical transit type surveys done during the period 1890-1914. This United States Geological Survey photogrammetric survey work is now complete and the evidence has been submitted to the Special Master.

Your Special Master believes that he cannot emphasize too strongly the importance of the telephone conference calls participated in by the attorneys for the parties and the Special Master. Thereby trips of counsel to Lincoln, Nebraska, or of the Special Master to Cincinnati, Ohio, became unnecessary and time and expense were saved.

Counsel and the experts, whose names are later mentioned, are to be commended for their willingness to listen, to continue negotiations, and to remember that after these cases are but a memory, the inhabitants of Ohio, Indiana, and Kentucky will be neighbors and should remain friends.

Your Special Master would be remiss if comment was not made upon the able and willing assistance and cooperation of the United States Geological Survey and the professional competence of its officials assigned to performing the varied tasks required and their diligence in completing these tasks in an efficient and timely manner. They have accomplished

results which some, in the course of the litigation, believed were impossible.

### **THE PROPOSED BOUNDARY**

While a transcript of the evidence taken October 27, 1983, will be filed with the Clerk of this Court as a part of this report, it is believed that a brief outline of the testimony supporting the tendered joint exhibits and this report will be sufficient.

Your Special Master believes, since the parties have jointly offered evidence as to the location of the 1792 low water mark boundary line that has been marked on the exhibits which will be hereafter mentioned, that it is unnecessary to reproduce in this report a digest of the testimony received by your Special Master. Suffice it to say, that the Ohio River is a very old river and, consequently, has many meanders. It is also true that it is an unusually stable river, largely confined by sandstone, limestone, and a gravel bed. The testimony also supports the observation that the Ohio River in 1838 had extremely low water and that the 1838 low water can be related to the 1792 low water mark.

The witnesses called included Donald C. Barnett, living in Reston, Virginia, an employee of the United States Geological Survey. He is the Assistant Chief of the Eastern Mapping Center, an entity of the National Mapping Division. He is a graduate of Pennsylvania State University, and is active in the day-to-day operation of the United States Geological Survey mapping factories at Reston.

Albert J. Petersen, Jr., of Alvaton, Kentucky, Professor of Geography at Western Kentucky University located at Bowling Green, Kentucky, teaches geography and historical geography. He has his BA and Master's Degrees from the University of Colorado and a Ph.D. from Louisiana State. He was originally employed by the Commonwealth in September, 1980.

The third expert who testified was Elmer M. Clark of Englewood, Colorado, a registered surveyor in the States of Colorado, Iowa, and five other states, and Chief Surveyor for the Shell Oil Company in the Rocky Mountain area extending from the Canadian border to the Mexican border. He was retained by Ohio in September, 1980, to do research in determining the location of the 1792 northerly low water mark as it could now be best ascertained.

Credence is also given to the opinion of these experts by the fact that counsel have also consulted hydrologists, geologists, experts in river morphology, and other professional disciplines who have given reassurance to the correctness of the processes used and of the determinations herein made.

Your Special Master concludes that all of these men are men of ability, whose factual testimony, conclusions, and opinions can be accepted as the basis for this report.

Your Special Master digresses to mention early history the Court may find of interest. One expert says "probably the best early survey of the river" is the Gordon Hutchens survey completed during June, 1766. Correspondence of General Anthony Wayne relating to the extreme, very low water stage of the Ohio River in 1792 and 1793 is mentioned in the evidence. Reports from the United States Board of Engineers making recommendations about navigation of the Ohio as early as 1821 have been considered and there is an 1838 report mentioning a mapping project of 1835.

Your Special Master believes, in view of the joint presentation of evidence by the parties, that a more detailed analysis of the early history of the Ohio River is unnecessary. Some brief discussion of the documentary evidence is warranted.

Exhibits 1 through 29, inclusive, which are maps prepared by the United States Geological Survey, are joint ex-

hibits of Ohio and Kentucky. These exhibits were prepared on Mylar sheets, a stable based material which has an advantage over paper in that it is not as subject to stretching or shrinking and thus it better assures the accuracy of the map data over long periods of time.

These 29 exhibits cover every foot of the Ohio River from the Ohio/West Virginia/Kentucky border, downstream to the border between Indiana and Ohio. The distance is approximately 175 miles. Each of Exhibits 1 to 29, inclusive, is based upon a separate quadrangle map prepared as a part of the mapping of the entire continental United States. To map the entire contiguous 48 states requires approximately 55,000 such maps. The United States Geological Survey in Reston, Virginia, is known as the Eastern Mapping Center, which is an entity under the National Mapping Division. It employs approximately 400 people whose mission is to map and revise maps for the 22 eastern states, which generally includes all states east of the Mississippi River, together with Puerto Rico and the Virgin Islands. The division has 30 people devoted solely to collecting boundary information and plotting that information on topographic maps. This is in addition to the work of the division's field force.

These quadrangle maps are known as 24,000 scale maps, each covering 7.5 minutes of latitude and 7.5 minutes of longitude. The 1:24,000 scale refers in map making to a map on which one inch on the map equals 2,000 feet on the ground. The width of the red line on Exhibits 1-29, inclusive, which is ten-thousandths of an inch, equates to 20 feet on a 1:24,000 scale map.

This red line on Exhibits 1 through 29, inclusive, marks 4439 points along the Ohio River, representing the low water mark on the northerly side of the Ohio River as it existed in the year 1792 as nearly as it can now be determined. On Exhibit 30 is found not only the latitude and longitude of each of the 4439 points shown on Exhibits 1

through 29, but the exhibit also correlates each of the 4439 latitude and longitude points with the state plane coordinates systems of Ohio and Kentucky. The state plane coordinate systems are indexed and can be found on Exhibit 30 as the Ohio South Zone and the Kentucky system as the Kentucky North Zone. Your Special Master believes that Exhibit 30, when read with Exhibits 1 through 29, will answer any questions that can hereafter arise as to the joint boundary of the State and Commonwealth.

Exhibits 1 through 29 have been prepared in keeping with the national mapping standards. The coordinates, which are numbered consecutively, always proceed down the river. Thus, point 1 on Exhibit 30 begins at the point common to the States of West Virginia and Ohio and the Commonwealth of Kentucky and continues downstream through point 4439, the point common to the boundary lines of the States of Ohio and Indiana and the Commonwealth of Kentucky. Joint Exhibit 30 precisely locates, by geodetic coordinates, the proposed angle points along the boundary line. It gives the geographic or geodetic coordinates. The experts appear to use these terms interchangeably. Exhibit 30 represents the approximation of the low water mark on the northerly side of the Ohio River in 1792 as it flows between Ohio and Kentucky as nearly as can be ascertained at this time. The red line shown on Joint Exhibits 1 through 29, as is noted above, depicts the line created by joining the 4439 points of latitude and longitude set forth in Joint Exhibit 30.

Exhibits 33 and 34 show the use of a digitizer, a process used in plotting these coordinates. The methodology used was termed by one witness as "excellent work." There is evidence that in translating the latitude and longitude into the state plane coordinates shown as Exhibit 30, in most cases the point is determined within one one-hundredth of a foot, which would be an eighth of an inch.

It appears from the evidence, and your Special Master so reports, that the ordinary surveyor in making a survey requiring determination of the location of any part of the boundary line between Ohio and Kentucky as recommended in this report, would use the state plane coordinates for Ohio and Kentucky rather than the latitude and longitude coordinates. Your Special Master concludes from the evidence that an average surveyor should be able to use either of the tables and locate or project the state boundary line out into the Ohio River and tell the distance from the line to any given point on the shore. It is the conclusion of your Special Master that Exhibits 1 through 30 each represent the best that can be done at this time under the present development of the mapping art. This determination of the low water mark boundary is as accurate a determination as can now be ascertained. Your Special Master is pleased to be able to tender such a fair and accurate solution for this boundary problem of nearly 200 years.

The original of these Joint Exhibits 1 to 30 and of Joint Exhibit 31, which is the Stipulation of the parties as to Exhibits 1 through 30, inclusive, and of Exhibit 35, will be filed as a part of this report. Copies of the proposed decree which will be recommended to this Court by your Special Master, if approved by this Court, together with duplicate Mylar originals of each of these Joint Exhibits 1 through 29 and of Joint Exhibits 30, 31, and 35, will be filed with the Auditor of the State of Ohio and with the Secretary of State of the Commonwealth of Kentucky. Copies of the Decree of this Court entered herein, including Exhibits 1 to 30, inclusive, also will be filed with the County Recorder's Office in the Counties of Lawrence, Scioto, Adams, Brown, and Hamilton in the State of Ohio; and in the County Clerk's Office in the Counties of Boyd, Greenup, Lewis, Mason, Bracken, Pendleton, Campbell, Kenton, and Boone in the Commonwealth of Kentucky.

## RECOMMENDATION

Your Special Master therefore requests approval of this report for the establishment of the boundary line between the State of Ohio and the Commonwealth of Kentucky as referred to me as Special Master. Your Special Master requests that the Court adopt the latitude and longitude of 4439 points along the river, together with the correlation of the latitude and longitude points with the state plane coordinate systems of Ohio and Kentucky, all as set forth on Exhibit 30 as the 1792 low water mark boundary between the State of Ohio and the Commonwealth of Kentucky. Your Special Master requests that the tendered decree be adopted, approved, and filed as recommended, together with copies of Joint Exhibits 1-31, inclusive, and Exhibit 35, as proposed.

That upon approval of this report and the making of the filings as ordered herein by the Court, that your Special Master be discharged from further duties in No. 27, Original upon filing a financial report, approved by the parties, showing receipt and disbursement of all monies paid to him by the parties and distribution of any balance remaining in his hands after payment of the expenditures approved by the parties to the State of Ohio and to the Commonwealth of Kentucky in the proportion contributed by each party to such fund. That the Order further provide that your Special Master is not to receive any payment or other recompense for his services herein other than the payments for



travel, hotel expenses and similar items as approved by the parties.

Respectfully submitted,

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**ROBERT VAN PELT**  
Special Master  
566 Federal Building  
100 Centennial Mall North  
Lincoln, Nebraska 68508

## INDEX OF EVIDENCE, INCLUDING EXHIBITS, ETC.

### Joint Exhibits

1	Catlettsburg Quadrangle Map	OHIO-WVA-KY (1975)
2	Ashland Quadrangle Map	KY-OHIO (1975)
3	Ironton Quadrangle Map	OHIO-KY (1975)
4	Greenup Quadrangle Map	KY-OHIO (1975)
5	Wheelersburg Quadrangle Map	OHIO-KY (1975)
6	Portsmouth Quadrangle Map	KY-OHIO (1975)
7	New Boston Quadrangle Map	OHIO-KY (1975)
8	Friendship Quadrangle Map	KY-OHIO (1974)
9	Pond Run Quadrangle Map	OHIO-KY (1967)
10	Garrison Quadrangle Map	KY-OHIO (1974)
11	Buena Vista Quadrangle Map	OHIO-KY (1967)
12	Vanceburg Quadrangle Map	KY-OHIO (1949)
13	Concord Quadrangle Map	KY-OHIO (1981)
14	Manchester Islands Quadrangle Map	KY-OHIO (1974)
15	Maysville East Quadrangle Map	OHIO-KY (1974)
16	Maysville West Quadrangle Map	KY-OHIO (1974)
17	Russellville Quadrangle Map	OHIO-KY (1974)
18	Higginsport Quadrangle Map	OHIO-KY (1974)
19	Felicity Quadrangle Map	OHIO-KY (1974)
20	Moscow Quadrangle Map	OHIO-KY (1981)
21	Laurel Quadrangle Map	OHIO-KY (1981)
22	New Richmond Quadrangle Map	OHIO-KY (1981)
23	Withamsville Quadrangle Map	OHIO-KY (1974)
24	Newport Quadrangle Map	KY-OHIO (1974)
25	Covington Quadrangle Map	KY-OHIO (1981)
26	Burlington Quadrangle Map	KY-OHIO (1974)
27	Addyston Quadrangle Map	OHIO-KY (1982)
28	Hooven Quadrangle Map	OHIO-IND-KY (1981)
29	Lawrenceburg Quadrangle Map	IND-OHIO-KY (1981)

- 30      Printout showing geographic coordinate systems and latitude and longitude at 4439 points. State plane coordinate systems for Ohio South Zone and Kentucky North Zone for same 4439 stations.
- 31      Stipulation of parties as to Exhibits 1 through 30
- 32      Photo of digitizing procedure
- 33      Photo of digitizing procedure
- 34      Photo of digitizing procedure
- 35      Stipulation that pages 89 and 90 be substituted for like numbered pages in Joint Exhibit 30 and that point number 4439 (p. 90, computer printout) describes the 1792 low water common boundary point (between Ohio, Kentucky and Indiana) as nearly as it can now be ascertained.

#### Ohio Exhibits

- 1      Ohio River Historical Research
- 2      Report of Secretary of War, dated November 28, 1838
- 3      Charts 86 through 137 inclusive & index sheet beginning with West Virginia & Kentucky border to Indiana/Ohio border.

#### Commonwealth of Kentucky Exhibits

- 1      Joint letter dated February 10, 1982, from attorneys for Ohio and Kentucky to U.S. Geological Survey re work authorized, preparing of charts, Mylar prints, etc.

**SUPREME COURT OF THE UNITED STATES  
OHIO v. KENTUCKY**

No. 27, Orig.      Decided \_\_\_\_\_, 1985

**DECREE**

It is ordered, adjudged and decreed that:

1. The boundary line between the State of Ohio and the Commonwealth of Kentucky is fixed as geodetically described in Joint Exhibit 30 to the Special Master's Report filed with this Court on \_\_\_\_\_, 1985. Joint Exhibit 30 is incorporated by reference herein.

2. Copies of this Decree, and the Special Master's Report (including Joint Exhibits 1-31 and 35) shall be filed with the Clerk of this Court, the Auditor of the State of Ohio, and the Secretary of State of the Commonwealth of Kentucky.

3. Copies of this Decree, and the Special Master's Report (including Joint Exhibits 30 and 35, and paper prints of Joint Exhibits 1-29, once they become available) shall be filed with the County Recorder's Office in Ohio and with the County Clerk's Office in the Commonwealth of Kentucky in each of the following counties: in Ohio, the counties of Lawrence, Scioto, Adams, Brown and Hamilton; and in Kentucky, the counties of Boyd, Greenup, Lewis, Mason, Bracken, Pendleton, Campbell, Kenton and Boone.

4. The State of Ohio and the Commonwealth of Kentucky each have concurrent jurisdiction over the Ohio River.

5. The costs of this proceeding shall be divided between the parties as recommended by the Special Master.







