IN THE Filed June 27, 1983

Supreme Court of the United States

OCTOBER TERM, 1982

NO. 86, Original

STATE OF LOUISIANA,

Plaintiff,

vs.

STATE OF MISSISSIPPI, ET AL.

Defendants.

REPORT OF SPECIAL MASTER

CHARLES J. MEYERS
Special Master

June 15, 1983

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I. Preliminary Statement

This action was brought by the State of Mississippi and Avery B. Dille, Jr., a Mississippi landowner, to determine the boundary between the two states in the vicinity of the Giles Bend Cutoff in the Mississippi River. Giles Bend Cutoff lies about four miles upstream from Natchez. The sole point at issue is the location of the boundary with respect to the bottom hole of a producing oil well situated beneath the bed of the river. If the boundary lies east of the bottom hole of the well, it is located in Louisiana; if west thereof, in Mississippi. Under Louisiana law, the state owns the bed of the river to the boundary; under Mississippi law, the riparian owner has title to the bed.

On July 8, 1970, Louisiana in its proprietary capacity executed an oil and gas lease covering the portion of the bed now in dispute, and on January 20, 1971, Avery B. Dille, Jr., acting for himself and others, did the same. Both leases were made to the same operator, and both described the boundary of the leasehold as the state line. In January, 1972, the oil and gas lessee completed an oil well on the parcel, drilling the well directionally from a surface location on the Dille land. The well, State of Louisiana Well No. 3, has been producing oil continuously since its completion.

The parties agree that the bottom hole location of the well was within the State of Louisiana at the date of its completion and the commencement of production. Louisiana maintains that the bottom hole location has remained within Louisiana during all years relevant to this proceeding. Mississippi and Avery B. Dille, Jr. assert that the state line migrated to the west, putting the bottom hole location of the well within the State of Mississippi for most of 1975, all of 1976, most of 1977, and seven months of 1981.

In addition to the competition between Louisiana and the Dilles over royalty from the well, there is involved here the jurisdiction of the two states for purposes of regulation and taxation.

II. History of the Litigation

On June 20, 1979, Avery B. Dille, Jr. filed a suit in the Chancery Court of Adams County, Mississippi, naming as defendants the State of Louisiana and the persons and entities holding working interests in the leasehold estates created by the Louisiana and Dille leases. Dille alleged that the Louisiana-Mississippi boundary had migrated in a westerly direction to the extent that the bottom hole location of the well was within Mississippi and subject to the provisions of the Dille leases.

The defendants removed the action to the United States District Court for the Southern District of Mississippi, Western Division, where the action is docketed as Civil Action No. W79-0069(R). The State of Louisiana then filed a motion for leave to file a bill of complaint in the United States Supreme Court on December 21, 1979. The Court granted the motion by its order of April 14, 1980. On the joint motion of all parties concerned, the District Court issued an order on June 25, 1980, staying the proceedings before that court.

By its order of October 19, 1981, the United States Supreme Court appointed the undersigned Special Master in this proceeding, designated as *Louisiana* v. *Mississippi,* No. 86, Original. A pretrial conference was held on December 16, 1981, in New Orleans, Louisiana, at which time a schedule was established for discovery in this proceeding. By my order of June 16, 1982, a stipulated pretrial order was adopted, with certain amendments, and the case was set for trial commencing on September 20, 1982. Individuals and corporations asserting mineral interests derived from the Louisiana lease filed with me a motion for leave to intervene on July 27, 1982. By order of September 3, 1982, and the memorandum opinion attendant thereto (attached as Appendix A), the motion to intervene was denied and the location of the Louisiana-Mississippi boundary relative to the bottom hole location of the oil well was specified

as the proper issue for the Court to resolve. The trial then was held on September 20-22, 1982, in New Orleans, Louisiana.

Post-trial briefs were filed by the parties and I prepared a Draft Report for comment and further argument. A hearing was held in Denver on March 17, 1983, after which this final Report was prepared. Following the argument and prior to the preparation of this Report, Mississippi asked that a boundary be fixed by geodetic coordinates for each hydrograph introduced into evidence. I deal with that request in Part VI of this Report.

III. The Applicable Law

The boundary between Louisiana and Mississippi has been the subject of litigation in the past. *Louisiana* v. *Mississippi,* 384 U.S. 24 (1966); *Louisiana* v. *Mississippi,* 282 U.S. 458 (1931); *Louisiana* v. *Mississippi,* 202 U.S. 1 (1906). In the earliest of these cases, the Court ultimately defined the disputed boundary on the basis of long acquiescence in Louisiana's assertion of a particular boundary and its exercise of dominion and sovereignty over the territory in question, 202 U.S. at 53-54. However, in that case as well as the other two, the Court adopted the general rule that the live thalweg or thread of the navigable channel of the Mississippi River constitutes the boundary between the two states. 384 U.S. at 24; 282 U.S. at 459; 202 U.S. at 53.

The law is settled that a boundary so defined may be dynamic in that it follows the course of the stream as its bed and channel change by the processes of erosion and accretion. *Arkansas* v. *Tennessee,* 397 U.S. 88, 89-90 (1970); *Arkansas* v. *Tennessee,* 246 U.S. 158, 173 (1918). The boundary may become fixed when, by the process known as avulsion, the stream suddenly leaves its old bed and forms a new one. 397 U.S. at 89-90; 246 U.S. at 173,175.

The fixing of a permanent boundary on account of avulsive activity, as an exception to the thalweg rule, has no application in this proceeding. The disputed area lies at the head of the Giles Bend Cutoff. All parties agree that construction of the Giles Bend Cutoff, when completed in 1938, resulted in an avulsion and the Louisiana-Mississippi boundary became fixed in the abandoned riverbed. However, upstream from the cutoff, the boundary continued to be defined by the live thalweg and thus remained migratory.[1]

Although the controlling principle in this case can be stated without difficulty, its application is complicated by an unfortunate lack of precision and consistency in the cases with respect to the definition of the term thalweg. For example, the Court in the earliest boundary case involving Louisiana and Mississippi stated that, as commonly used, the term thalweg meant "the middle or deepest or most navigable channel." 202 U.S. at 49. These three standards need not yield the same result, and the Court has offered little guidance as to which one should be selected.

The thalweg doctrine has been characterized as a rule of statutory construction to effect the intent of Congress when it established the boundaries of newly admitted States by general references to a river or to the "middle" of a river. *Texas* v. *Louisiana,* 410 U.S. 702, 710 & n. 6 (1973). The Court there noted that the thalweg rule was adopted as authoritative doctrine in *Iowa* v. *Illinois,* 147 U.S. 1 (1982). In the latter

[1] Early in the proceedings, Louisiana contended that the fixed boundary established by the avulsion negated any effect on the boundary of movement of the live thalweg. Louisiana presented no evidence at trial to support this proposition and the argument was not presented in Louisiana's post-trial brief. I take the position of all parties to be that the location of the Louisiana-Mississippi boundary relative to the bottom hole location of the well must be determined by reference to the live thalweg. The sole evidence before the Court relates to the location of the live thalweg in the disputed area from 1972 through 1982.

case, Iowa asserted that the boundary between the two states was a line equidistant between the banks of the Mississippi River; Illinois asserted that the boundary was the channel upon which commerce on the river was usually conducted. The Court looked to principles of international law generally applicable when a navigable steam separates two sovereign states and found that the thalweg or middle of the channel of the stream was generally regarded to be the line of demarcation between the two states. 147 U.S. at 8. The thalweg doctrine was found to be premised on a legal presumption that the right to navigation on the river was common to both states. *Id.* The Court recognized that the concern about equal access for navigation was not particularly "cogent" in this country, but nonetheless concluded that the thalweg doctrine should control absent a statutory change or longstanding contrary usage. *Id.* at 10.

Notwithstanding the Court's reservations about the practical importance of equal access for navigation, the Court did state that equal access was the "controlling consideration" in reaching the conclusion that the boundary line in navigable rivers between two states generally is "the middle of the main channel of the river." *Id.* at 13. The Court has since noted that two states bordering on a navigable river have equal access to it for navigation in any event. *Texas* v. *Louisiana, supra,* at 710. Thus, equality of access for navigation has importance not as a policy matter, but as a matter of statutory construction to effect the intent of Congress. When, as in the present case, the thalweg doctrine applies, the operational definition given to the term thalweg should be consistent with the underlying premise of the doctrine which Congress is deemed to have had in mind.

The decision in *Iowa* v. *Illinois, supra,* is consistent with this proposition. The Court stated that when a river has more than one channel, the boundary lies at "the middle of the principal one, or, rather, the one usually followed." *Id.* at 13.

The Court also cited a treatise on international law to the effect that where the deepest channel in the river and the channel ordinarily used for navigation are not the same, the latter constitutes the line of demarcation between two states. *Id.* at 9.

The Court confronted a choice between the two standards in *Minnesota* v. *Wisconsin,* 252 U.S. 273 (1920). The deepest water hugged the western shoreline and Minnesota asserted that the boundary line should be placed in the middle of the deepest water. In ruling against Minnesota, the Court articulated the following interpretation of the thalweg doctrine:

> The doctrine of *Thalweg,* a modification of the more ancient principle which required equal division of territory, was adopted in order to preserve to each State equality of right in the beneficial use of the stream as a means of communication. Accordingly, the middle of the principal channel of navigation is commonly accepted as the boundary. Equality in the beneficial use often would be defeated, rather than promoted, by fixing the boundary on a given line merely because it connects points of greatest depth. Deepest water and the principal navigable channel are not necessarily the same. The rule has direct reference to actual or probable use in the ordinary course, and common experience shows that vessels do not follow a narrow crooked channel close to shore, however deep, when they can proceed on a safer and more direct one with sufficient water.

Id. at 282.

Thus, the thalweg defines the boundary, and the ordinary course of traffic on the river defines the thalweg. More particularly, the thalweg is the track ordinarily taken by boats in their course downstream. *New Jersey* v. *Delaware,* 291 U.S. 361 (1934). The ultimate concern of the Court in applying the thalweg doctrine lies in identifying the actual or probable downstream course of river traffic. In the present case, the boundary line in the disputed area must be determined by reference to evidence of the course commonly taken down-

stream by vessels in navigating that reach of the river. The evidence presented by the parties must be weighed in terms of its value for making the necessary inference as to the ordinary course of downstream traffic on the river. This interpretation and application of the thalweg doctrine is entirely consistent with the approach adopted by the Special Master and sustained by the Court in *Louisiana* v. *Mississippi,* 384 U.S. 24 (1966).

IV. Summary of the Evidence

Louisiana presented the testimony of two expert witnesses, Mr. Hatley N. Harrison, Jr. and Mr. Leo Odom. Mississippi presented the testimony of one expert witness, Mr. Austin B. Smith.

Mississippi raised questions as to the relative qualifications of the witnesses. In particular, counsel for Mississippi and Mr. Dille emphasized the fact that Mr. Smith has had superior experience with boundary problems in alluvial rivers, since he has appeared as an expert witness in a number of boundary cases in which the thalweg doctrine applied.

The concept of the thalweg has a practical point of reference in the ordinary course of dowstream traffic on the river. Identifying or giving one's considered opinion as to the location of the live thalweg in a particular reach of a particular river does not present a unique problem that is totally independent of problems generally relating to the behavior of rivers.

Each witness is a trained engineer who has spent most or all of a very lengthy professional career working on problems related to flood control, navigation, and the surveying and mapping of rivers. Each witness has professional qualifications needed to identify, interpret, and evaluate data relevant to the problem of locating the live thalweg in the disputed reach of the river. Each witness did a commendable job.

One hundred and one exhibits were entered into evidence in conjunction with the testimony of the expert witnesses. In particular, one or more hydrographic surveys were introduced into evidence for each of the years 1972 through 1982. The surveys are the product of the Corps of Engineers, U.S. Army Engineer District, Vicksburg, Mississippi. In every case, the surveys contain the following data:

—soundings which, at north-south feet, indicate the elevation of level;

—the average low water plane relative to mean sea level;

—contour lines which, at 10 foot water relative to the average low the configuration of the riverbed; and

—study gage data which indicate the actual stage of the river at and which, in conjunction with the the actual depth of water during a particular time period.

In most cases, the surveys also note the location of lights placed by the U.S. Coast Guard as an aid to navigation. A few of the surveys also note the location of buoys placed in the river by the U.S. Coast Guard and the location of floats, the configuration and spacing of which indicate the direction and relative velocity of the current in different parts of the river. The surveys and the data contained thereon provide substantial evidence upon which to base an inference as to the navigation line of downstream traffic in the ordinary course and, concomitantly, the location of the live thalweg.

In conjunction with the hydrographic surveys, Louisiana also introduced into evidence Channel Reports issued by the U.S. Coast Guard at various times during years 1976 through 1982. The reports are based on soundings taken on specified dates, and these dates generally were close in time to the date of the surveys with which they were introduced. These reports state a recommended course by reference to lights and buoys and, as stated therein, are to be used in conjunction with Corps

Engineers Navigation Maps, the Mississippi River System Light List, and Local Notice to Mariners. The latter publications were not offered into evidence. Given the operational definition of the thalweg stated above, the Channel Reports also provide substantial evidence upon which to base an inference as to the navigation line of downstream traffic in the ordinary course and, again, the location of the live thalweg.

Louisiana also introduced into evidence excerpts from annual editions of a document identified as Flood Control and Navigation Maps of the Mississippi River, which is prepared by the Mississippi River Commission, an organization under the supervision of the Corps of Engineers. In particular, Louisiana introduced into evidence Map No. 38 on each annual edition of which a channel line is depicted for the disputed reach of the river.

Mississippi objected to the evidence at the trial, on which a ruling was reserved, and continued the objection in its brief. As at trial, the precise nature of the objection is not altogether clear. It relates generally to the relevance of the maps and more particularly to the weight that should be given to the depicted channel line as evidence of a preferred sailing line in the disputed reach of the river.

The scale of the maps is very large, 1:62,500, and they are published annually. Each annual edition comes out several months into the year subsequent to the date of the edition. The scale of the maps and their infrequent publication indicate that they can serve only as a very general guide to navigation. The legend sheets on one of the documents, the 1981 edition, state in explaining the depicted channel line that the latest navigation bulletins should be consulted for detailed sailing directions.

The maps and the channel line depicted thereon constitute some evidence of the preferred sailing line in the disputed reach of the river, but they are not substantial evidence on that point.

However, as transposed onto the hydrographic surveys by Mr. Harrison and Mr. Odom, the reasonableness of the depicted channel line for purposes of locating the live thalweg can be evaluated by reference to all of the other data introduced into evidence which carry more weight. Therefore, use of the depicted channel line does not present a serious evidentiary problem. The depicted channel is persuasive evidence of the location of the live thalweg only to the extent that it is reasonably consistent with all of the other relevant data.

The hydrographic surveys provide a basis for briefly summarizing the general characteristics of the disputed reach of the river. Broadly defined for descriptive purposes, that area extends from Gibson Light on the Louisiana shore downstream to Giles Bend Cutoff Light on the Mississippi shore. Measured north-south, this portion of the river is approximately four miles long. The general shape of this portion of the river is an elbow-like bend with the concave bank on the Mississippi side. The Giles Bend Cutoff Light and the bottom hole location of the well are located approximately one mile downstream from the point of the elbow-like bend. The Gibson Light is located approximately 2½ miles upstream from the point of the bend. Exhibit P-8 is an informative pictorial representation of this area.

If each column of soundings noted on the surveys is taken as a section of the river, an uninterrupted trough of deep water — water markedly deeper than in all other portions of a particular section and of consistent depth from section to section — is never present in the disputed area. A trough of deep water generally lies along the right descending (Louisiana) bank upstream from the point of the bend, although it covers most of the riverbed in some years, with the deepest water more toward the middle of the river. With less variation from year to year, another trough of deep water appears along the left descending (Mississippi) bank downstream from the point of the elbow. In general, the trough begins upstream from the Giles Bend Cutoff Light and is roughly 200 yards wide in

the portion of the river adjacent to that light. The left descending bank against which the trough lies is very steep. Variations from year to year related primarily to the rapidity with which the trough fans out to encompass most of the river downstream from the point of the bend.

The riverbed rises markedly between the two troughs of deep water. The size and shape of this expanse of shallower water and the configuration of the riverbed underlying it vary from year to year. In each of the years 1972 through 1982, downstream traffic through the Giles Bend area had to traverse an expanse of shallower water between the two troughs. This shallower passage was called a "crossing" by the experts, and that term is also used by mariners.

The absence of an obvious, uninterrupted trough of deep water throughout the Giles Bend area presumably underlies the disagreement between the expert witnesses. The disagreement is over the course of navigation through the crossing environment.

The sailing line or live thalweg placed on the hydrographic surveys by Mr. Harrison, an expert witness for Louisiana, passes to the east of the bottom hole location of the well for each of years 1972 through 1982 and, thus, leaves the well within the confines of the State of Louisiana throughout that period. The line so placed on the surveys by Mr. Harrison is, without modification, the channel line depicted on the various editions of Map No. 38. In most cases, the year of the edition of Map No. 38 is the same as the year of preparation and publication of the hydrographic survey onto which the channel line was transposed. In some cases the years differ. Mr. Harrison explained that either the edition of Map No. 38 was not available (1982) or another edition was more appropriate because it was based on data from a point closer in time to the date of the hydrographic survey.

Mr. Harrison transposed the channel line from Map No. 38 to the hydrographic survey by measuring from reference points

common to both and adjusting for the differences in scale. Both in response to direct examination and to cross-examination, Mr. Harrison testified that he did not restrict himself to the mechanical transposition of the channel line. He compared the transposed channel line to the data on the hydrographic surveys and in the Channel Reports. In each case, he could see no need to modify the transposed channel line.

Mr. Odom, Louisiana's other expert witness, placed three lines on hydrographic surveys for each of years 1972 through 1982. One of the lines was identified as the "geological thalweg." It is a line connecting the deepest points in each 1000-foot cross section of the river. The line is irregular in shape, and he did not offer it as the preferred line for establishing the location of the live thalweg. It serves to illustrate the crossing characteristics of the disputed area. The line proceeds irregularly along the right descending bank or middle of the river upstream from the point of the bend and then crosses the riverbed to the left descending bank and proceeds downstream.

Mr. Odom also placed a line on the surveys which was the locus of the points equidistant from 9-foot contour lines on the opposite sides of the river. The apparent rationale for this line is that a project has been authorized to maintain a 300-feet wide channel of water at least nine feet deep throughout this reach of the river. He did not depict the middle of a 300-feet wide channel because water of a depth greater than nine feet relative to the average low water plane was available throughout an expanse of this reach of the river far in excess of 300 feet, at least for years 1972 through 1982. Mr. Odom did not offer this line as a preferred sailing line, stating that he very much doubted that downstream traffic would follow a course along the line. The line does serve to illustrate a complicating factor in determining the locations of the live thalweg. If water that is deeper than nine feet can be characterized as "safe" for navigation because no dredging would be needed pursuant to

the project, then a wide avenue of "safe" water is available throughout the disputed area for all of years 1972 through 1982.

Mr. Odom's third line, which he did offer as the preferred sailing line/live thalweg, is the channel line depicted on Map No. 38 as transposed onto the hydrographic surveys by a photographic process that enlarged Map No. 38 to match the scale of the surveys. This line and Mr. Harrison's line do not coincide. Mr. Odom's transposed lines comport more nearly with the shape of channel lines as depicted on the editions of Map No. 38. Mr. Harrison's lines reflect his method of transposition as they are a series of straight lines drawn between reference points. The lack of coincidence between the two sets of lines is not material in the sense that each version of the transposed channel lines always passes well to the east of the bottom hole location of the well.

Little weight can be given to Mr. Odom's adoption of the channel line to represent the preferred sailing line/live thalweg. He admitted that he adopted the channel line because it is a sailing line established by competent people who are responsible for safe navigation on the river. He did not compare the line against data on the surveys and against more timely sailing directions. The evidence needed to make such comparisons is, however, before the Court.

Mr. Smith was the expert witness for Mississippi. He placed one line on each of the hydrographic surveys introduced into evidence in conjunction with his testimony and each such line reflects his opinion as to the location of the live boundary. Some care is needed in summarizing Mr. Smith's methodology.

Early in his testimony, Mr. Smith illustrated the manner in which a navigator would set and follow a course between the Gibson Light and the Giles Bend Cutoff Light. He stated that a navigator would take his tow past Gibson Light in the deep

water along the right descending bank and reorient himself at some point downstream from that light by reference to a bearing on the Giles Bend Cutoff Light. This use of the two lights for piloting this reach of the river he characterized as "filling in the marks." Then, at some point upstream from the Giles Bend Cutoff Light, the navigator would "break down" his tow by turning slightly to the right, or to the west, to pass the Giles Bend Cutoff Light with the tow pointed in the direction of the general flow of the river. The relationship of this description to the precise location of any of his live boundary lines remained unclear because he never gave a specific bearing on the Giles Bend Cutoff Light.

Later in his testimony, Mr. Smith stated that the live boundary is a function of three factors: the downstream course, the track of navigation, and the thalweg. As defined by him, the downstream course and the track of navigation are closely related, if not identical. The track of navigation can be established from navigational aids, such as lights and bulletins to mariners; these aids are put out for the downstream (not the upstream) course. By his definition, the thalweg is the line of deepest and swiftest water. He stated that the thalweg generally could be determined or "locked in" by looking to the soundings and contour lines on the hydrographic surveys. When it could not be so determined, the track of navigation could be "locked in" by referring to the navigation lights.

Apparently Mr. Smith never explicitly used the navigational aids to determine the track of navigation and establish the live boundary. He repeatedly referred to the locking in of the thalweg by reference to the data on the hydrographic surveys. On redirect, he was asked whether his live boundary lines fell within the "marks" relative to the navigation lights. He stated that he did not use the marks. He determined the live course according to the thalweg evident on the surveys. In short, Mr. Smith's methodology was to place the live boundary

along the line of deepest and swiftest water that he could discern from the soundings and contour lines on the surveys. This methodology was applied to all reaches of the stream, including the crossing.

V. The Years in Dispute

The live boundary lines placed on the surveys by Mr. Harrison and Mr. Odom lie to the east of the bottom hole location of the well throughout the period from 1972 to 1982. Mr. Smith's live boundary lines also lie to the east of the bottom hole location of the well from 1972 through 1974.

Mr. Smith's live boundary line placed on a survey dated February, 1974 lies 550 feet to the east of the bottom hole location. The boundary line that he placed on a survey dated March, 1975 (Ex. D-10) lies 100 feet to the west of the bottom hole location. By interpolation, he calculated that the boundary passed over the bottom hole in a westerly direction on January 11, 1975. His boundary line remains to the west of the bottom hole on all the surveys he presented up to the survey dated May, 1978.

On a survey dated May, 1977 (Ex. D-16), his boundary line lies 750 feet to the west of the bottom hole. He placed his boundary line 500 feet to the east of the bottom hole on the next survey he presented, which was dated May, 1978 (Ex. D-17). By interpolation, he calculated that the boundary passed over the bottom hole in an easterly direction on December 20, 1977.

Mr. Smith's boundary line remains to the east of the bottom hole until a survey dated November, 1981 (Ex. D-21). On that survey, he places the boundary 120 feet west of the bottom hole, nearly 300 feet to the west of where he placed it on a preceding survey dated March, 1980 (Ex. D-19). By

interpolation, he calculated that the boundary passed over the bottom hole in a westerly direction on April 10, 1981. He similarly calculated that the boundary passed over the bottom hole in an easterly direction on December 5, 1981.

Thus, Mr. Smith presents a migrating boundary line that shifts the jurisdictional location of the well from Louisiana to Mississippi, from Mississippi to Louisiana, from Louisiana to Mississippi and back again to Louisiana. The witnesses for Louisiana opined that the boundary line never shifted far enough west to change the jurisdictional location of the well. Thus, the parties are in material conflict with respect to years 1975, 1976, 1977 and 1981.

A. *The Boundary in 1975.* Three copies of a hydrographic survey dated February, 1974 were introduced into evidence in conjunction with the testimony of the expert witnesses. The version of the boundary line placed on a copy of the survey by each expert witness passes to the east of the bottom hole location of the well. Thus, each expert witness is of the opinion that the well remained within the State of Louisiana in 1974.

Three copies of a hydrographic survey dated April, 1975 also were introduced into evidence in conjunction with the testimony of the expert witnesses. Mr. Harrison placed on the survey (Ex. P-19), as he did on the 1974 survey, the channel line depicted on the 1974 edition of Map No. 38 and could see no reason to modify that channel line for use as the boundary. As in 1974, Mr. Harrison's version of the boundary line lies approximately 940 feet to the east of the bottom hole location of the well as measured perpendicularly from the boundary line to the bottom hole location.[2]

[2] The measurements stated herein for the distance from Mr. Harrison's and Mr. Odom's boundary lines to the bottom hole location were all made in this manner. For Mr. Smith, I took the distances written on his copies of the surveys and summarized at pages 435-437 of the transcript.

Mr. Odom also transposed onto the survey (Ex. P-65) the channel line depicted on Map No. 38. However, he apparently used the channel line from the 1975 edition of Map No. 38. The channel line adopted by Mr. Odom as the boundary line was approximately 990 feet to the east of the well[3] in February, 1974 and approximately 675 feet to the east of the well in April, 1975. Thus, the boundary line as proposed by Mr. Odom migrated to the west between 1974 and 1975, but not enough to change the jurisdictional location of the well.

Mr. Smith proposes a significant migration of the boundary line to the west from 1974 to 1975. He places the boundary line 550 feet to the east of the well in 1974 and 150 feet to the west of the well in April, 1975. Thus, Mr. Smith shifts his boundary line 700 feet to the west relative to the well and thereby places the well in Mississippi.

The reasonableness of the proposed boundary lines must be weighed by reference to the data available on the hydrographic surveys. No Channel Reports were introduced in conjunction with the 1974 and 1975 surveys. The only navigational aids depicted on those surveys are the lights, and the position of the lights did not change from 1974 to 1975. In particular, the Gibson Light is on the Louisiana bank approximately 3½ miles upstream from the well; the Giles Bend Cutoff Light is on the Mississippi bank approximately 400 feet downstream from the well and approximately one mile downstream from the concave or elbow-like point of the bend in the river. An inference as to the migration, or the absence of any substantial migration, of the boundary must be made by reference to the lights, the changing depths of water and the configuration of the riverbed as revealed by the surveys.

The characteristics of the disputed reach of the river in February, 1974 can be observed on Exhibits P-17, P-64 and D-

[3] "Well" and "bottom hole location of the well" are used interchangeably herein.

9 and can be characterized in words in the following manner. The upstream trough of deep water extends to a point approximately one mile upstream from the well. It lies along the right descending bank and generally is 300 or more yards wide. The downstream trough of deep water lies along the left descending bank and is approximately 200 yards wide upstream from the well. Downstream from this point, the trough fans out over the next mile and one-half and eventually covers almost all of the riverbed. A portion of the riverbed along the left descending bank upstream from the bend lies less than 10 feet beneath the average low water plane and is bordered by an area of the riverbed that is 10 to 20 feet beneath the average low water plane. A portion of the riverbed less than 10 feet beneath the average low water plane extends out from the right descending bank in the area of the well and is bordered by a portion of the riverbed that is 10 to 20 feet beneath the average low water plane and under which the well lies. Within the crossing environment, a broad avenue of water 20 feet or more deep at average low water lies between the two troughs of deep water and the two areas of shallow water. Passage through the crossing anywhere within this avenue would result in downstream traffic passing to the east of the well.

A number of changes in the characteristics of the disputed reach of the river are evident from examination of the survey dated April, 1975 (Exhibits P-19, P-65, and D-11). The upstream trough of deep water narrows markedly at a point approximately 2½ miles upstream from the well. Thereafter, the trough is a narrow strip that hugs the right descending bank for another mile. The downstream trough of deep water is not markedly changed, although it fans out more gradually. The broad avenue of water more than 20 feet deep between the two troughs of deep water present in 1974 is no longer present in April, 1975. One can traverse the crossing only by passing through water that would be less than 20 feet deep at low water.

Mr. Smith defined the nature of the crossing environment in April, 1975 by placing 15-foot contour lines on the survey, using the soundings found thereon (Ex. D-11). Areas within these contour lines would be covered by less than 15 feet of water relative to the average low water plane.

One such area lies along the left descending bank upstream from the point of the bend, extends out toward the middle of the river in the shape of a narrow stem, and then expands into the shape of a two-pronged fork approximately in the middle of the bend. The other such area extends out from the right descending bank in the area of the well.

The boundary line placed on the April, 1975 survey by Mr. Smith appears to be based on two factors, the location of the upstream trough of deep water and the location of the shallow water indicated by the 15-foot contour lines. As an indicator of the probable course of downstream traffic, Mr. Smith's boundary line presents several problems.

First, the line is not consistent with Mr. Smith's own testimony as to the manner in which a navigator would proceed between Gibson Light and the Giles Bend Cutoff Light. The line does not reflect an attempt to "fill in the marks" along a course determined by reference to the Giles Bend Cutoff Light. Upstream from the bend, Mr. Smith's line hugs the right descending bank so closely and for so long a distance that its heading bears almost no relationship to that light. Moreover, the line reflects no "breaking down" of the tow (that is, making a turn) upstream from the Giles Bend Light so that the tow is headed downstream by the time it passes the light.

The second problem relates to one of the apparent advantages of Mr. Smith's proposed boundary line. It lies in or near the deepest water available upstream from the bend. However, the relative locations of the two troughs of deep water precludes, absent an implausible sharp turn to the left, making such full use of the deepest available water both upstream and

downstream from the bend. Traffic passing along Mr. Smith's boundary line would fail to take advantage of the first 3,500 to 4,000 feet of the downstream trough of deep water. Thus, Mr. Smith's line cannot be justified on the basis that it is located in the deepest water. It is so located upstream from the bend, but it is not so located downstream.

Mr. Smith's emphasis on the deep water upstream apparently is a function of the location of the shallow water indicated by the 15-foot contour lines. As Mr. Smith's line departs from the trough of deep water, approximately one mile upstream from the well, the line passes through a narrow opening between the fork-like area of shallow water in the middle of the bend and the shallow water that extends out from the right descending bank. The opening is approximately 200 feet wide, and the water therein is 3 feet deeper than the water to either side.

Mr. Smith's proposed boundary line represents the only plausible course of downstream traffic that avoids the 15-foot water entirely. It also is the only plausible course that passes to the west of the well.

Nothing in the record indicates a necessity for avoiding the 15-foot contour areas entirely. The study gage data indicate very high water during this period and safe navigation was possible virtually anywhere within the crossing environment. Even if one infers the probable course of downstream traffic by reference to water depths relative to the average low water plane, water 15 feet deep apparently would be safe since the Corps of Engineers project for this reach of the river prescribes maintenance of a channel only 9 feet deep.

If the areas within the 15-foot contour lines need not be avoided entirely, then the data on the survey suggest an alternative course, one closely approximated by the channel line depicted on the 1975 edition of Map No. 38. A navigator following this course would bring his tow out of the upstream

trough of deep water at the point where the trough narrows markedly, approximately 2½ miles upstream from the well. He would bring his tow through the crossing along a gradual arc generally in more than 15 feet of water and cross over the area within the 15-foot contour lines at only one point, approximately one mile upstream from the well, where that area is a very narrow stem and the water within it is 13 to 15 feet deep.

This alternative sailing line has a number of apparent advantages. It makes use of the Giles Bend Cutoff Light as an aid to navigation and generally comports with "filling in the marks" along a course determined by that line. It also reflects a gradual "breaking down" of the tow so that it points downstream as it passes the light and enters the trough of deep water. At that same location, a tow proceeding along Mr. Smith's route would still be "breaking down" and would skirt the shallow water along the right descending bank.

Considering all of the data on the survey, I infer that downstream traffic in the ordinary course probably followed the alternative sailing line described above, rather than the one proposed by Mr. Smith. This inference precludes placement of the live boundary to the west of the well in April, 1975.

Copies of the hydrographic survey dated September, 1975 also were introduced into evidence in conjunction with the testimony of the expert witnesses. The data on the survey indicate very little change in the characteristics of the crossing environment. Using the same methodology and considering the same factors as employed on the April, 1975 survey, Mr. Smith placed a boundary line on the September, 1975 survey (Ex. D-12). This boundary line presents the same problems as his earlier line.

Smith's September, 1975 line hugs the right descending bank in deep water upstream from the well and then threads the needle between two areas of shallow water defined by 15-foot contour lines. It is necessary to thread the needle to avoid

the shallow water because, as I read the second set of soundings upstream from the well, the 15-foot contour line on the left almost touches Mr. Smith's boundary line. As a result of aiming for this narrow opening between the two areas of shallow water, Mr. Smith's line passes 100 feet to the west of the well. It also passes over shallow water downstream from the well.

Once again, the channel line depicted on the 1975 edition of Map No. 38, and offered as the live boundary by Mr. Harrison (Ex. P-20) and Mr. Odom (Ex. P-66), closely approximated an alternative route didata on the survey. This route does involve entry into shallow water approximately 2,500 feet upstream from the well and continuance within this shallow water for approximately 1,200 feet. However, the soundings indicate that the riverbed is flat in this area and the water would be 13 feet deep even at low water.

The alternative route has the same apparent advantages that it did in April, 1975. Considering all of the data on the survey, I infer that downstream traffic in the ordinary course probably followed the alternative route rather than the one proposed by Mr. Smith. This places the live boundary approximately 675 feet to the east of the well.

Based on all of the evidence in the record relevant to 1975, I find that the live boundary did not migrate over the well in a westerly direction during 1975, and at all times during that year the live boundary remained to the east of the well.

B. *The Boundary in 1976.* Three sets of hydrographic surveys were introduced into evidence in conjunction with the testimony of the expert witnesses. The surveys were dated April, July, and October, 1976.

The version of the live boundary placed on each survey by Mr. Smith (Exs. D-13, D-14, and D-15) reflects a straight-line course across the neck of Giles Bend Cutoff. The boundary lines so placed by Mr. Smith pass to the west of the well by 500 feet in April, 510 feet in July, and 480 feet in October.

Mr. Harrison transposed onto each survey (Exs. P-22, P-25, and P-27) the channel line depicted on the 1976 edition of Map No. 38 and could see no reason to modify this line for purposes of locating the live boundary. On each survey, the line passes to the east of the well by approximately 940 feet.

Mr. Odom also transposed onto each survey (Exs. P-67, P-68, and P-69) the channel line depicted on an unspecified edition of Map No. 38 and offered these lines as the live boundary. The lines pass to the east of the well by approximately 730 feet in April and July and by approximately 940 feet in October.

The reasonableness of these various versions of the live boundary can be evaluated by reference to the data on the surveys. In addition, a number of Channel Reports, in which the Coast Guard recommends a course through the disputed reach of the river, were introduced into evidence by Louisiana.

The survey for April (*e.g.*, Ex. P-22) indicates several changes in the river relative to 1975. The long, narrow trough of uninterrupted deep water upstream from the bend along the right descending bank has become a long, narrow pool surrounded by water 20 to 30 feet deep. An uninterrupted trough of deep water lies more toward the middle of the river and extends to a point two miles upstream from the well. The deep water downstream from the bend remains essentially unchanged. A broad expanse of water 10 to 20 feet deep lies between the two troughs of deep water and cannot be avoided by mariners. The crossing is otherwise wide open in the sense that the 10-foot contour lines lie very close to either bank. One small sand bar in the middle of the bend can be avoided easily by passing to either side.

Mr. Smith drew in two areas of shallow water defined by reference to 15-foot contour lines (Ex. D-13). One area extends out from the left descending bank upstream from the well. The other extends out from the right descending bank in

the area of the well. Mr. Smith shows his boundary line passing between these two areas.

As I read the soundings, the two areas of shallow water join approximately 1,000 feet upstream from the well.[4] Thus, Mr. Smith's route would minimize, but not eliminate, crossing through the shallow water. The boundary lines proposed by Mr. Harrison and Mr. Odom, if followed by downstream traffic, would involve traversing a broader portion of the shallow water. However, the portion so traversed would be more than 10 feet deep at low water and almost 30 feet deep at the stage of the river indicated by the study gage data.

One advantage of a route along Mr. Smith's boundary line relates to the truism that the shortest distance between two points is a straight line. In addition, Mr. Smith's boundary line has the advantage of lying in the deepest water within the crossing environment, from a point approximately 1½ miles upstream from the well to a point 1,000 feet upstream from the well. However, this advantage can be gained only at the cost of disregarding several thousand feet of deeper water available upstream from the crossing as well as the first mile of deep water downstream from the bend. The deep water would tend to attract mariners to a route along the channel line depicted on the 1976 edition of Map No. 38, or east thereof.

The Channel Reports are inconclusive. The one nearest in time to the April survey was based on soundings taken on June 29 (Ex. P-24). It recommends no specific course for proceeding downstream from Gibson Light. This failure to state any

[4] Most surveys that were introduced into evidence, including Exhibit D-13, are composites which join together two surveys for portions of the river upstream and downstream from Giles Bend. On Exhibit D-13, the upstream and downstream surveys indicate different figures for the average low water plane. It is not clear which figure should be used for purposes of drawing contour lines. Mr. Smith used the higher elevation indicated on the downstream survey, which has the effect of diminishing the area within the 15-foot contour lines.

specific bearing on the lights, along with the omission of any reference to Giles Bend Cutoff Light and an unusual reference to the Cowpen Island Light further downstream, indicated to mariners that the crossing area was wide open.

Given the characteristics of the crossing environment, Mr. Smith's boundary line is plausible as an indicator of the probable route of downstream traffic in the ordinary course. However, maximum use of deep water recommends a sailing line very similar to the one inferred for 1975. In addition, such a line would have allowed the mariner to keep his tow pointed down the river with no sharp turns and without encountering hazardous water within the crossing environment. I infer that the probable course of downstream traffic in April, 1976 lay along the channel line depicted on the 1976 edition of Map No. 38 or to the east thereof, and passed to the east of the well by approximately 1,000 feet.

The survey for July indicates very little change in the river, except that an avenue of water 20 to 30 feet deep is available within the crossing environment to the west of the well; Mr. Smith places his boundary line in the middle of this avenue (Ex. D-14). Thus, the location of the deepest water within the crossing environment recommends a course along Mr. Smith's boundary line. Once again, the location of the deep water troughs above and below the bend suggests a course along or to the east of the channel line depicted on the 1976 edition of Map No. 38. No hazards within the crossing environment preclude following either course.

Louisiana introduced into evidence a Channel Report based on soundings taken on July 8 (Ex. P-26). The Coast Guard therein recommends proceeding downstream from the Gibson Light toward a point 200 yards open, or to the right of, the Giles Bend Cutoff Light and then passing that light 200 yards open. The channel line offered by Mr. Harrison and Mr. Odom closely approximates this recommended course, with the

exception that it lies approximately 280 yards open on the Giles Bend Cutoff Light. Mr. Smith's boundary line bears virtually no relationship to the recommended course, as the line is directed at and passes a point 2,000 feet open on the light. Based on the survey and the Channel Report, I infer that downstream traffic in the ordinary course continued to be drawn toward the Mississippi bank by the location of the deep water and passed approximately 1,000 feet to the east of the well.

Essentially the same analysis and the same conclusions apply with respect to the October survey. The survey indicates little change in the river except for the absence of any uninterrupted avenue of water 20 to 30 feet deep within the crossing environment. A Channel Report based on soundings taken on October 6 (Ex. P-28) indicates no change in the course recommended by the Coast Guard.

The survey does indicate the location of a number of buoys in this reach of the river. When proceeding downstream, the mariner is to give the red buoys a wide berth on his left and the black buoys a wide berth on his right. A mariner proceeding along Mr. Smith's boundary line would nearly overrun the first black buoy and would have the second black buoy to the left of his tow as he passed that buoy. Mr. Smith asserted that the second buoy appeared to be off station. In responding to questions on cross-examination, he objected to the placement of the second buoy because it lay in the path of his boundary line, an objection which places the cart before the course. The evidence provided by the survey and the Channel Report supports the inference that downstream traffic continued to follow a course along or to the east of the channel line on Map No. 38 and passed approximately 1,000 feet to the east of the well. I find from all of the evidence that the probable route of downstream traffic in the ordinary course throughout 1976 passed to the east of the well.

C. *The Boundary in 1977.* One hydrographic survey, dated May, 1977 was introduced into evidence in conjunction

with the testimony of each of the expert witnesses. Mr. Harrison and Mr. Odom transposed onto the survey the channel line depicted on the 1977 edition of Map No. 38. As transposed by Mr. Harrison (Ex. P-29), the channel line passes to the east of the well by approximately 800 feet. As transposed by Mr. Odom (Ex. P-70), the channel line passes to the east of the well by approximately 730 feet. Mr. Smith's boundary line reflects a straight-line course across the neck of Giles Bend which passes to the west of the well by 750 feet (Ex. D-16).

I can find no evidence in the record to support the placement of Mr. Smith's boundary line. The upstream trough of deep water lies in the middle of the river and not along the right descending bank where Mr. Smith places his line. The deepest water available within the crossing environment lies consistently in the middle or eastern half of the river and not along the right descending bank. Mr. Smith places his boundary between two areas of shallow water defined by 15-foot contour lines. The contour lines may be misdrawn. *See* note 4, *supra.* At low water, the water would be less than 15 feet deep throughout almost the entire western two-thirds of the river, from the bend to the well, and Mr. Smith's boundary line lies in the middle of this shallow water. The downstream trough of deep water lies along the left descending bank and Mr. Smith's line, as a course for navigation, would make no use of the first mile of this deep water. A Channel Report introduced into evidence (Ex. P-31) recommends the same course as recommended in the 1976 reports. The 1977 channel line closely approximates this course. Mr. Smith's boundary line bears no relationship to the recommended course.

I find that downstream traffic in the ordinary course during 1977 passed to the east of the well by approximately 800 feet.

D. *The Boundary in 1981.* Although the expert witnesses do not agree on the precise location of the boundary for 1978-1980, they all agree that it lay to the east of the well. They

similarly agree as to the location of the boundary in 1982. Only 1981 remains in dispute.

Copies of a hydrographic survey dated April, 1981 were entered into evidence in conjunction with the testimony of the expert witnesses. Mr. Harrison transposed onto the survey the channel line depicted on the 1980 edition of Map No. 38 (Ex. P-46) and noted that the 1980 and 1981 editions did not appear to differ as to the location of the channel. He could see no reason to modify the channel line for purposes of locating the live boundary. This channel line passes to the east of the well by approximately 780 feet.

Mr. Odom transposed onto the survey the channel line depicted on an unspecified edition of Map No. 38 (Ex. P-74). This live channel line passes to the east of the well by approximately 729 feet.

The boundary line placed on the survey by Mr. Smith reflects an essentially straight-line course across the neck of Giles Bend (Ex. D-20). This boundary line passes directly over the well.

The reasonableness of these boundary lines can be evaluated by reference to the data on the survey. In addition, Louisiana introduced into evidence a Channel Report based on soundings taken on April 10, 1981 (Ex. P-47).

The soundings and contour lines on the survey indicate the presence of the upstream trough of deep water in the middle of the river, extending to a point approximately 1¼ miles upstream from the well. A separate pool of deep water lies along the right descending bank upstream from the well. The trough of deep water downstream from the bend remains essentially unchanged relative to its location and characteristics in earlier years. A broad avenue of water 20 to 30 feet deep lies within the crossing environment between the two troughs of deep water.

The location of the deep water upstream and downstream from the bend would tend to attract mariners to a course along or to the east of the channel lines transposed onto the survey by Mr. Harrison and Mr. Odom. This course would have the advantage of maximizing the use of the deep water troughs, shortening the crossing, and encountering no hazards within the crossing.

A course along Mr. Smith's boundary line also would encounter no hazards within the crossing environment. However, this course would fail to make use of substantial portions of the deep water troughs and thereby lengthen the crossing. The apparent rationale for so lengthening the crossing involves passage through the crossing environment in the deepest available water. The soundings on the survey indicate that a course along Mr. Smith's boundary line would provide little or no advantage in this respect.

The Channel Report recommends proceeding downstream from the Gibson Light toward a point 200 yards below, or downstream from, the Giles Bend Cutoff Light and passing 300 yards open on that light. The channel lines transposed onto the survey are consistent with the recommended course. Mr. Smith's boundary line bears almost no relationship to the recommended course.

Based on the evidence provided by the data on the survey and the Channel Report, I infer that downstream traffic in the ordinary course followed a route along or to the east of the channel lines transposed from Map No. 38 and passed to the east of the well by approximately 780 feet. The evidence does not support an inference that the downstream course, and the live boundary, migrated markedly to the west and passed over the well.

Copies of a hydrographic survey dated November, 1981 also were entered into evidence in conjunction with the testimony of the expert witnesses. Once again, Mr. Harrison trans-

posed onto the survey, and offered as the live boundary, the channel line from the 1980 edition of Map No. 38 (Ex. P-43). Mr. Odom also transposed onto the survey the same channel line that he transposed onto the April survey (Ex. P-75). Mr. Smith placed his version of the live boundary line onto the survey and this line passes to the west of the well by 120 feet (Ex. D-21).

The soundings and contour lines on the survey indicate little change in the river between April and November, except that a small sand bar lies 18 to 19 feet below the surface of the river at low water just upstream from the well. The sand bar can be avoided by passing either to the right or to the left as one proceeds downstream.

Once again, the relative advantage of a course along or to the east of the 1980 edition of the channel line would involve maximum use of the deep water troughs and shortening of the crossing. Within the crossing environment, Mr. Smith's boundary line would offer the advantage of deeper water only for a portion of the river extending from 1¼ to ¾ miles upstream from the well. None of the proposed boundary lines pass over the small sand bar mentioned above.

A Channel Report based on soundings taken on November 12 (Ex. P-45) recommends the same course as that recommended in the earlier Channel Report issued in April. The channel lines transposed onto the survey by Mr. Harrison and Mr. Odom closely approximate this course. Mr. Smith's boundary line bears very little relationship to the recommended course.

Based on the data on the survey and on the Channel Report, I infer that downstream traffic in the ordinary course followed a route along or to the east of the channel lines transposed onto the survey by Mr. Harrison and Mr. Odom and passed to the east of the well by approximately 780 feet. I find that throughout 1981 the probable course of downstream traffic, and the live boundary, remained to the east of the well.

VI. Fixing A Boundary

In oral argument on the Draft Report and thereafter in a brief, Mississippi requested that the Master draw a boundary for each of the years 1972-1982. Specifically, the Mississippi brief "urges the Special Master . . . to precisely determine, by geodetic coordinates and for each hydrograph admitted into evidence, the location of the interstate boundary between Mile 367 and Mile 370, including the portion thereof, if any, consisting of the 'dead thalweg' in Giles Bend Cut-Off.'" Supplemental Post-Trial Brief in Behalf of Defendants, pp. 13-14. Mississippi advances four reasons for the request:

1. Special Masters and the Court have drawn boundaries in most other cases.

2. Westward movement of the boundary affects the size of production units, with those on the Mississippi side growing larger as the boundary moves west.

3. Fixing the boundaries for 1972-1982 would aid in fixing boundaries in the future, if litigation should arise.

4. The Court will be in a better position to evaluate this report if the Special Master draws his own sailing line on the hydrographs.

Louisiana does not object "to the Special Master, if he so desires, placing his version of the boundary upon a hydrographic chart or charts. . . . [H]owever, it would seem to be a meaningless and useless exercise in that any line placed thereon has no future effect because such a boundary is considered, by all concerned, to be 'live.'"

I respectfully decline to draw my own version of the boundary line for each of the 11 years for which hydrographs were admitted in evidence. The issue in this case, from the time it was first filed in state court, and as pled and tried in this Court, is the location of the boundary in relation to the bottom hole of Louisiana State Well No. 3. I have found as fact that the

boundary was never west of the well in the disputed years. That finding, if confirmed by the Court, disposes of the controversy. It therefore seems to me to be wholly gratuitous and improper to draw a boundary line for seven undisputed years and for four years in which the well was found to be on the Louisiana side. To test this conclusion, one can ask this question: if Louisiana State Well No. 3 did not exist and if Mississippi asked leave of this Court to file an action in the original jurisdiction to determine the boundary between Mile 367 and Mile 370 on the Mississippi River for the years 1972-1982, would the Court grant the leave? I think not, for so far as appears, absolutely nothing of consequence would turn on the decision. While I found no case directly in point, the Court has always been careful, especially in interstate litigation in its original jurisdiction, to require a genuine controversy with the threat of immediate harm before exercising its jurisdiction. See *Arizona* v. *California,* 283 U.S. 423 (1931), at 462-64. The Court has made it plain that it will not give advisory opinions or render decisions in moot cases. *Preiser* v. *Newkirk,* 422 U.S. 395 (1975); *North Carolina* v. *Rice,* 404 U.S. 244 (1971); *United States* v. *Alaska Steamship Co.,* 253 U.S. 113 (1920). The exception to the mootness doctrine illustrated by *Southern Pacific Terminal Co.* v. *I.C.C.,* 219 U.S. 498 (1911) does not apply in this case, for a determination of the boundary for the years 1972-1982 does not forestall a controversy in future years.

Mississippi's four reasons for granting the relief requested are not persuasive that a controversy exists apart from the location of the well in relation to the boundary. While, as Mississippi asserts, boundaries have been drawn in many other cases, in most of them, as Mississippi concedes, the boundary became fixed because the change was avulsive. In such cases, the decree is meaningful and forward looking, because it determines permanent sovereignty over dry land. In this case, the proposed decree would determine where the boundary was, but not where it is now or will be in the future. As the foregoing

review of the evidence demonstrates, the thalweg changes constantly; wherever it was between 1972-1982, it is not there now except by pure chance. In every case cited by Mississippi some consequence followed from a boundary determination. For example, in *Louisiana* v. *Mississippi,* 384 U.S. 24 (1966), a case on which Mississippi places great reliance, the issue again was the location of the boundary in relation to a producing well. The parties stipulated the 1964 boundary, but it was necessary to go back in time and locate the boundary in 1954, when the well was completed, and in the years thereafter. Since there were no surveys after 1952, the Master resolved the issue by fixing a boundary in 1952 and interpolating the location of the boundary in relation to the well annually until 1964, using a constant rate of change in the calculation. Thus, it was convenient, though perhaps not necessary, for him to specify the location of the boundary in relation to the well for each year in question. Since the master did find that the boundary changed so as to move the well from Louisiana to Mississippi, it was essential to determine when that change occurred. In this case, I have found the well to be located at all relevant times in Louisiana. Accordingly, it is moot where the boundary may have been located from 1972-1982.

Mississippi asserts that the size of drilling units changes with changes in the boundary. That may be true, but Mississippi does not say why it matters, and I doubt that it does. Until the boundary moves far enough west to place the well in Mississippi, that state would seem to lack power to tax or regulate the flow of oil. If Mississippi claims those powers when the well is outside its territorial limits, it has not said so.

Mississippi also claims that fixing the boundaries for each of 11 years would somehow aid the Court in future litigation. I do not see how. The parties agreed that the thalweg was moving easterly in late 1981 and early 1982. But in 1983 or some later year it could move back to the west. Either state desiring an adjudication in some future year will present its case

as the evidence was presented here: it will seek to prove the sailing line for the period of time in question. The exact location of the line in 1982 will have no bearing on the evidence to be produced in the future.

Lastly, Mississippi argues that the Court's review of this Report will be aided by my drawing of a boundary. That is for the Court to judge, but I am doubtful. The issue addressed was whether the live thalweg ever passed to the west of the well in the years in dispute. I am unpersuaded by the evidence adduced by Mississippi that it did; I am persuaded by Louisiana's evidence that the thalweg was at all relevant times east of the well. Beyond that, I did not consider where the boundary might have been located, since in my view it makes no difference. Nothing advanced by Mississippi convinces me otherwise.

VII. Conclusion

I conclude that the thalweg of the Mississippi River in the disputed area is the boundary between the State of Louisiana and the State of Mississippi and that the ordinary course of traffic on the river defines the thalweg. Specifically, the thalweg is the track ordinarily taken by boats and barges in their course downstream.

I find that in the disputed years — 1975, 1976, 1977 and 1981 — the thalweg of the river was never west of the bottom hole location of State of Louisiana Well No. 3 and that, accordingly, the well was throughout those years located in the State of Louisiana.

I recommend a decree, if one be needed, adjudging that from January, 1972 until March, 1982 State of Louisiana Well No. 3 was at all times located within the State of Louisiana.

Denver, Colorado
June 15, 1983

Respectfully submitted,

CHARLES J. MEYERS
Special Master

APPENDIX A

IN THE SUPREME COURT OF THE UNITED STATES

NO. 86, ORIGINAL

STATE OF LOUISIANA,

Plaintiff,

vs.

STATE OF MISSISSIPPI, ET AL.

Defendants.

MOTION OF CHESLEY PRUET, *ET AL.* FOR LEAVE TO INTERVENE

OPINION

In this original action before the Court, commenced by the State of Louisiana against the State of Mississippi and Avery B. Dille, Jr., a Mississippi landowner, the principal issue as defined by the pleadings relates to the boundary between the two States, which Mississippi alleges has moved westward by virtue of a change in the course of the Mississippi River. Because of this alleged change in the boundary, a parcel of oil-producing land that the parties concede was once located in Louisiana may now be located in Mississippi, with the result that Louisiana would no longer have the power to regulate and collect taxes on the land and would no longer be entitled to royalty payments under the oil and gas lease it executed when it was the undisputed owner of the land.

Before Louisiana filed this action, Mr. Dille had filed an action in a Mississippi state court against Louisiana and a number of parties with mineral claims to the disputed parcel. Some of those claimants, defendants in the court action, are Movants for Leave to Intervene here. The state court action was

removed to the U. S. District Court for the Southern District of Mississippi, and the judge stayed the action pending the outcome of this suit.

The Movants assert mineral rights derived from the State of Louisiana under the oil and gas lease and claim that those rights are in jeopardy if the boundary has moved. Mr. Dille may have title to the land if the boundary has moved, and both he and the State of Mississippi may have monetary claims against Movants under those circumstances. Thus, the Movants are concerned with two issues: the title to the disputed land and the relationship of the several parties if the boundary has moved and Mr. Dille is now the owner of the land. The first issue is the boundary question, which is the issue Louisiana and Mississippi wish to litigate in this case. The second issue is the accounting for past revenues if title to the land has passed from Louisiana and its lessee to Mr. Dille. Mississippi, in its Memorandum in Opposition to the Motion, has made clear its opposition to the adjudication of the second issue in this proceeding. Nevertheless, Movants argue that efficiency will be served by resolving all issues arising from the boundary dispute in one adjudication.

From the limited perspective of this case only, the argument may have some merit, but from the broader perspective of the duties and responsibilities of the United States Supreme Court, and mindful of its heavy case load and its limited resources, the argument must fail. The Court has repeatedly said that its original jurisdiction should be invoked sparingly and the issues adjudicated closely confined to interstate disputes. *New Jersey* v. *New York,* 345 U.S. 309 (1953); *Kentucky* v. *Indiana,* 281 U.S. 163 (1930). *See Utah* v. *United States,* 394 U.S. 89 (1969).

Intervention of private parties is discouraged. They are permitted to join the litigation only when they have some special interest that will not be adequately protected by the States and other parties already joined in the litigation. *New*

Jersey v. *New York, supra.* Thus, the doctrine that each State represents its citizens *parens patriae* is, at least in part, a means of confining litigation that otherwise could become unmanageable if every affected party were permitted to participate. *Kentucky* v. *Indiana, supra.*

Movants cite two cases as justifying the intervention, *Texas* v. *New Jersey,* 379 U.S. 674 (1965) and *Texas* v. *Florida,* 306 U.S. 398 (1939). Neither case is apposite. In the first, Texas sued New Jersey, Pennsylvania and the Sun Oil Co. to determine which state had the right of escheat to debts owed by Sun to missing creditors. Florida was allowed to intervene to assert its escheat claim, but no issue was raised as to intervention by private parties. *Texas* v. *Florida* was similar; suit was brought in the Court's original jurisdiction by one state against other states to determine the domicile of decedent for purposes of collecting inheritance taxes. Intervention by private parties was not an issue.

The threshold issue in this case is the boundary between the two States. If the boundary has moved, Louisiana has lost sovereignty over the disputed parcel, and may also have lost its title to the land. If Louisiana's title fails, so does the derivative title of Movants. Louisiana has a strong incentive to represent fully its interests in the land, and thereby also to represent fully the interests of the Movants. They have no independent or different interest from Louisiana in the boundary issue. The circumstances are accordingly appropriate for the application of the *parens patriae* doctrine, for in the absence of differing, special or conflicting interests, private parties are adequately represented by the State in interstate litigation in the original jurisdiction of the Supreme Court. Since the Movants' presence would not afford them added, needed protection nor provide the Court with added, needed assistance in resolving the boundary issue, their intervention on that issue should be denied.

On the subsidiary issue of an accounting, the interests of the Movants may deviate from those of Louisiana and the defendants, but that is a reason for denying intervention, not granting it. As Mississippi suggests in its Memorandum of Opposition, no good reason appears for that State to be a party to a litigation between Louisiana as an oil and gas lessor and its lessee for an accounting when the lessor's title fails. And as Mississippi further points out, Louisiana's title may not fail, and an accounting may not be required, since she may prevail on the ultimate question of the location of the boundary. But if the defendants prevail and an accounting becomes necessary, that proceeding, which does not involve a controversy between States, should be pursued in another tribunal, one candidate being the Federal District Court for the Southern District of Mississippi, where an action involving this subject matter is now pending, subject to a stay until the disposition of this case. If the Eleventh Amendment poses problems there, it poses the same problems here.

The Motion for Leave to Intervene is denied because the proper issue for this Court to resolve is the location of the boundary between the State of Louisiana and the State of Mississippi, because the accounting issue may not arise; and because, it if does, it should not be adjudicated in the original jurisdiction of the United States Supreme Court.

Denver, Colorado this 3rd day of September, 1982.

CHARLES J. MEYERS,
Special Master

IN THE SUPREME COURT OF THE UNITED STATES

NO. 86, ORIGINAL

STATE OF LOUISIANA,

Plaintiff,

vs.

STATE OF MISSISSIPPI, ET AL.

Defendants.

ORDER

It is hereby ordered that the Motion for Leave to Intervene filed by Chesley Pruet, Robert Mosbacher, R. E. Williams, Estate of Bruce Sciscoe, deceased, Pruet & Hughes Company, and Bates Oil Corporation be denied.

Denver, Colorado this 3rd day of September, 1982

CHARLES J. MEYERS,
Special Master