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**BEFORE THE ARIZONA NAVIGABLE STREAM  
ADJUDICATION COMMISSION**

**In re: Determination of Navigability of  
the Lower Salt River in Maricopa County**

**No. 03-005-NAV**

**Maricopa County and The Flood Control  
District of Maricopa County's  
Memorandum to the Arizona Navigable  
Stream Adjudication Commission  
(ANSAC) Regarding Navigability of the  
Lower Salt River in its "natural and ordi-  
nary" condition on February 14, 1912.**

The Arizona Navigable Stream Adjudication Commission ("ANSAC" or "Commission") has asked interested parties to submit memoranda addressing the question whether certain rivers were navigable in their "natural and ordinary" condition on February 14, 1912 as required by *State ex rel. Winkleman v. Ariz. Navigable Stream Adjudication Comm'n*, 224 Ariz. 230, 229 P.3d 242 (App. 2010) ("Opinion"). This Memorandum is submitted by Maricopa County and the Flood Control District of Maricopa County ("County and FCD") by under-signed counsel in response to that request.

**I. The River Must Be Evaluated In Its Ordinary, Un-diverted, Natural Condition.**

As the County and FCD argued in its contemporaneously filed memorandum on the Gila River, which is incorporated herein by this reference, navigability for title purposes un-

der the equal-footing doctrine, is determined at the time of statehood based on the “ordinary and natural” condition of the river.

The phrase, “ordinary and natural,” requires giving effect to both words. *Winkleman*, 224 Ariz. at 241 ¶25, 229 P.3d at 253. “Ordinary” is defined as “[o]ccurring in the regular course of events; normal; usual.” *Id.* at ¶ 26. “Natural” means “[u]ntouched by civilization, i.e., man-made diversion.” *Id.* at ¶ 27. The court specifically held that any unnatural diversion is “not part of the natural condition of the River.” *Id.* Accordingly, the Commission must consider how the diversion of the flow at the time of statehood affected the natural and ordinary flow of the Salt River.

Finally, pursuant to *PPL Montana, LLC v. Montana*, 132 S. Ct. 1215, 1229-30 (2012), this analysis must be performed for each discrete and administrable segment of the river.

## **II. Evidence In The Record Demonstrates The Lower Salt River Was Susceptible To Navigation For Commerce In Its Ordinary And Natural Condition At Statehood.**

To analyze the record adequately, it should be evaluated using a three step process: 1) determine what evidence exists demonstrating the watercourse’s natural conditions; 2) determine what evidence exists of the ordinary condition of nature for that watercourse; and, 3) determine and analyze evidence of susceptibility to navigation under the preceding conditions characterizing “natural” and “ordinary.”

The relevant period for determining the “natural” condition of the river is after the effects of any Native American diversions had disappeared but before commencement of modern-era settlement when other man-made diversions and obstructions began affecting the river. *Winkleman*, 224 Ariz. at 242 ¶30, 229 P.3d at 254. The relevant period is the early to mid-1800s before 1860. *Id.*

### **A. There is ample evidence in the record demonstrating by a preponderance of the evidence that the lower Salt was susceptible to navigation at statehood.**

As discussed *infra*, the reports entitled ARIZONA STREAM NAVIGABILITY STUDY FOR THE SALT RIVER: GRANITE REEF DAM TO THE GILA RIVER CONFLUENCE prepared by JE

Fuller/Hydrology and Geomorphology for the Arizona State Land Department (Evidence Log (“EL”) #30) (“ASLD Report”), and the report HYDROLOGY ALONG THE NATURAL CHANNEL OF THE SALT RIVER by Mr. Hjalmar W. Hjalmarson (EL #22) (“Hjalmarson Report”) evaluating the pre-development physical conditions of the river are the best evidence demonstrating the river’s natural condition during the appropriate period. The ASLD Report gathered data estimating pre-development flow rates (EL #30, at 5-5, Table 5-3) and Mr. Hjalmarson independently calculated the amount and temporal distribution of the “ordinary and natural” flow in the Salt River from the confluence with the Verde River to its mouth on the Gila River using known hydrologic and geomorphic information and relationships. [EL #22 at 1] These figures are consistent with each other. Unlike Drs. Littlefield, August, and Schumm, Mr. Hjalmarson analyzed the river in its “ordinary” and “natural” condition. [Hearing Transcript (“TR”) 4/7/2003 127:24-129:9; 130:17-131:24; 180:18-181:8; 201:17-202:17]<sup>1</sup> His report was not refuted.

“Natural” conditions include both large volume flows (a.k.a. floods) of up to 294,000 cfs [EL #30 at 7-22], and low volume drought conditions when only base flow is present (*i.e.*, 260 cfs) [EL#22 at 1]. However, while “natural,” the navigability analysis must exclude those unusual events because they are not “ordinary.” Instead, the analysis must focus on the usual flows, which are established by the mean (a.k.a. average) and median flow rates, which were estimated in the ASLD Report and calculated by Mr. Hjalmar W. Hjalmarson.

The ASLD Report estimated the pre-development “natural” flow rates in the lower Salt using multiple indirect methods such as tree-ring climatic reconstruction (Smith and Stockton, 1981), short-term records made prior to statehood (Davis, 1897), reconstruction of pre-development flows derived from modern gauge records (Thomsen and Porcello, 1991), accounts of early explorers (Bartlett, 1854), and extrapolations based on irrigation capacity (Kent, 1911). (EL #30, at 5-4-5-5)

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<sup>1</sup> References to the hearings are cited by “page number:line number(s)”.

The ASLD Report summarized the various estimates of the pre-diverted river and created hydraulic rating curves for six locations along the lower Salt. (EL #30, at 7-23-7-26) Based on these various estimates (indirect, direct, historical accounts), the pre-diversion Salt River was determined to be a perennial river, with an average annual discharge of 1,300 to 1,700 cfs, the average flow rate in February was about 1,200 cfs. These flow rates correspond to flow depth of 3.5 feet, width of 300 feet, and velocity of 2 feet per second. (*Id.* at 7-26-7-27)

Mr. Hjalmarson is a licensed professional engineer. [Evidence Log (“EL”) #22-Hjalmar W. Hjalmarson, *Hydrology Along the Natural Channel of the Salt River*, curriculum vitae (February 25, 2003)] He served as an engineer and hydrologist for the U.S. Geological Survey for thirty-one years. [*Id.*] As a surface water specialist for the Arizona district for twelve years, he was responsible for ensuring the hydrologic data collected, analyzed, and compiled conformed to applicable standards. [*Id.*] As part of his duties, he directed hydrologic studies and wrote many published technical reports on surface water hydrology of arid lands. He has also testified in various Arizona courts as an expert witness on the nature of streamflow. [*Id.*]

Using data from the U.S. Geological Survey,<sup>2</sup> Mr. Hjalmarson computed the annual pre-development Salt River base flow using the Freethey and Anderson (1986) basin accounting method for natural stream base flow for ground-water systems. [*Id.* at 1] This method uses natural conditions existing **before human activities**. [*Id.*] Using this method, he calculated the pre-development base flow rate of the river as 260 cubic feet per second (“cfs”). [*Id.*] Because of stored groundwater that supplied base flow, it may not have varied greatly year to year. Base flow is important for navigability because under natural conditions the water that

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<sup>2</sup> Mr. Hjalmarson relied upon the following publication: B.W. Thomsen & J.J. Porcello, U.S. Geological Survey, PREDEVELOPMENT OF THE SALT RIVER INDIAN RESERVATION, EAST SALT RIVER VALLEY, Arizona, Water-Resources Investigations Report 91-4132 (1991) (*available at* <http://pubs.usgs.gov/wri/1991/4132/report.pdf>); and, Geoffrey W. Freethey & T.W. Anderson, U.S. Geological Survey, PREDEVELOPMENT HYDROLOGIC CONDITIONS IN THE ALLUVIAL BASINS OF ARIZONA AND ADJACENT PARTS OF CALIFORNIA AND NEW MEXICO (1986) (*available at* <http://pubs.er.usgs.gov/publication/ha664>). [EL #22]

seeped into the ground was temporarily stored in aquifers throughout the watershed. That water later discharged to the streams as base runoff during dry periods (a.k.a. droughts). This is the amount of water (260 cfs) that would flow down the Salt beginning at the confluence with the Verde River 90% of the time. [*Id.*]

Absent any other controverting evidence in the record, the foregoing evidence establishes by preponderance what the “natural” conditions were at statehood.

With respect to the “ordinary” condition of the lower Salt, the Commission must disregard both the unusual flashy high-flow (a.k.a. flood) conditions, and drought low-flow conditions as both are not the usual, normal, or everyday condition of the lower Salt. *Winkleman*, 224 Ariz. at 241 ¶27, 229 P.3d at 253. The best evidence in the record of what is the usual condition is found in the ASLD Report [EL #30], and in Mr. Hjalmarson’s Report [EL #22].

After determining the extremes of what constitutes “natural” conditions, Mr. Hjalmarson then calculated the “ordinary” (*i.e.*, mean and median) annual predevelopment discharge at the confluence of the Verde and Salt Rivers by combining average annual predevelopment streamflow for both rivers. [EL #22 at 1] The average annual predevelopment streamflow at the confluence of the Verde and the Salt Rivers was 1,250,000 acre-feet (1,730 cfs). [*Id.*]<sup>3</sup> The estimated median annual predevelopment streamflow was 950,000 acre-feet (1,310 cfs).<sup>4</sup> [*Id.*] Half of the days have streamflow less than 1,310 cfs, half have streamflow higher than 1,310 cfs.

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<sup>3</sup> Alan Gookin testified that the pre-diversion mean daily discharge was 1,712 cfs. [TR 4/7/2003, 153:21-155:6] Dr. Schumm admitted the lower Salt was perennial in its natural condition, [TR 4/7/2003, 201:22-25] and that a canoe could probably navigate the river in that condition. [*Id.* at 203:10-12]. Nevertheless, Drs. August, Littlefield, and Schumm made no efforts to determine the natural condition of the river as part of their evaluation of navigability. [*Id.* at 120:24-131:17; 180:18-181:8; 205:2-12], thus, their conclusions should be given no weight when making a navigability determination where natural conditions are to be used.

<sup>4</sup> The median streamflow is the flow value at 50% of the time. [*Id.*]

Because the Commission must base its decision on what it finds are “ordinary” conditions, rather than rare or extreme conditions of flood or drought, the averages estimated by the ASLD Report and calculated by Mr. Hjalmarson for the natural river are the best available evidence. Average means, “not out of the ordinary: common.” WEBSTER’S NINTH NEW COLLEGIATE DICTIONARY 119 (1987). Therefore, the best evidence in the record of what constitutes “ordinary” for the purpose of navigability for title are the average and median conditions. Because no other evidence disputes these figures, this evidence more than meets the preponderance of the evidence standard required by A.R.S. § 37-1128(A) of what is the “ordinary” condition of the lower Salt River.

**B. Evidence of boats used on the Salt River pre-statehood demonstrates susceptibility to commercial navigation.**

In addition to Mr. Hjalmarson’s unrefuted hydrologic analysis, record evidence of actual navigation supports finding the lower Salt River susceptible to navigation. The ASLD report lists sixteen accounts of navigation that occurred on the Salt River after 1873, well after significant diversions had already begun on the Salt. [EL #30 at 3-19 & Exhibit 1 hereto] The boats used were typically low-draft flat-bottomed boats, skiffs, or canvas or wooden canoes drawing between four to six inches. [EL #30 at 8-3] The criteria for navigating canoes in use as of statehood are not substantially different from the criteria for canoes available today. [*Id.*] Logically, the vessels described above would have been capable of navigating on the Salt under the conditions determined to be “ordinary” pre-diversion. This is further evidence that the “ordinary” and “natural” lower Salt River was susceptible to navigation.

**C. Historical and anecdotal evidence supports finding the lower Salt susceptible to commercial navigation at statehood.**

The ASLD Report lists many descriptions of the river leading to the conclusion that it was susceptible to navigation in its natural condition. One such account is by James Ohio Pattie describing the lower Salt at its confluence with the Verde River in February 1826. [EL #30 at 3-14] He wrote, “It affords as much water at this point as the Helay.... We found it to abound with beavers. It is a most beautiful stream, bounded on each side with high and rich

bottoms.” [Id.] A later explorer, John R. Bartlett, head of the U.S. Boundary Commission, described the lower Salt in 1852 as, “from eighty to one hundred feet wide, from two to three feet deep...” [EL #30 at 3-14] An even later description in an 1877 guidebook entitled “Arizona As It Is” described the lower Salt as follows: “[a]t low water it is a clear, beautiful stream, having an average width of two hundred feet for a distance of one hundred miles above its junction with the Gila, and a depth of two feet or more.” [Id. at 3-15] The latter account was written well after diversions began.

Notwithstanding there is ample evidence of actual navigation on the lower Salt, the estimates of “ordinary” and “natural” conditions and the flow characteristics necessary for boating identified in the ASLD Report demonstrate by a preponderance of the evidence, that the river was susceptible to navigation in its “ordinary” and “natural” condition.

### **III. Evidence Presented By Opponents To Navigability Does Not Relate To The “Ordinary and Natural” Condition Of The River And Therefore Carries No Weight.**

#### **A. Dr. Stanley Schumm’s report does not support a finding of non-navigability.**

Dr. Schumm’s opinion of non-navigability should be given no weight because it is based solely on the conditions of the river in an un-natural, post-diversions condition. [TR 4/7/2003 204:25-205:12] Although Dr. Schumm describes the river as relatively unstable braided channel, he acknowledged that a braided river can be navigable if it has enough water. [Id. at 202:15-17] His conclusion of non-navigability is premised on the channel being in a highly disturbed, depleted condition on February 14, 1912 caused by numerous floods. [EL #26 at 5, Table 2]<sup>5</sup> He analyzed the river condition beginning in 1870 through 1934 to arrive at this opinion. [TR 4/7/2003 196:13-197:12] The river, however, was already partially diverted beginning in 1867. [EL #30 3-6-3-7]

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<sup>5</sup> Dr. Schumm described a flow of 20,000 cfs or greater as a flood. [EL #26 at 4]

Clearly, the river has changed markedly since large irrigation diversions began in the late 1800s. Dr. Schumm did not analyze whether the river would have been navigable in its natural and ordinary condition (*i.e.*, absent diversions and large extraordinary floods). [TR 4/7/2003 204:25-205:12] Dr. Schumm's conclusion does not provide the kind of evidence that permits the Commission to determine that the Salt River was not susceptible to navigation. His evidence does not defeat the evidence establishing by a preponderance that the Salt River was susceptible to navigation at statehood. ANSAC must carefully evaluate the evidence in the record to determine what weight to assign to each piece in the context of the *Winkelman* ruling that evidence of the river in its "ordinary and natural" condition must be given more weight than later evidence.

**B. All of the evidence cited by Drs. Littlefield and August relates to the condition of the river after significant diversions of water from the river or its tributaries had already begun.**

Like Dr. Schumm's opinion that is premised on observations of a depleted river, Dr. Littlefield's opinion of non-navigability should be given no evidentiary weight because it too addresses the river as of 1912, by which time the river was already almost entirely diverted for irrigation and therefore not in its "ordinary" or "natural" condition. [EL #16 at 1] Dr. Littlefield did not even attempt to evaluate the "natural" condition of the river. [TR 4/7/2003 180:18-181:8] In response to a questioning from FCD's counsel, the following exchange took place.

Q. Do you also agree that your opinions are not based on the condition of the Salt River and its normal and natural state prior to any diversions or man-made structures being placed on the river?

A. **That's correct.**

Q. All right. Now, your contemporaneous observers that you rely on are observers who looked at the river in the state it was in at the time they were looking at it?

A. **Correct.**



Q. For example, a person in 1912 looking at the river and rendering an opinion would be looking at it under the condition that you heard earlier testified, that there was only 5 percent of the natural flow left in the river, right?

A. **That's correct.**

[*Id.*] Dr. Littlefield admitted that his opinions are contrary to *Defenders of Wildlife v. Hull*. [TR 4/7/2003 180:2-17] He admitted that the contemporaneous observer reports that he relied upon for his report were of the river in an unnatural and disturbed condition. [*Id.*] The conclusion that contemporaneous reports by observers should be given less weight regarding a finding of non-navigability is also supported by the fact that first annual report of the Reclamation Service issued in 1903 recognized that irrigation in the Gila and Salt Basins had already developed to a point where there was insufficient water for the fields. [EL #16 at 132-133] Clearly, that amount of diversion is not the "ordinary and natural" condition of the river. Dr Littlefield's conclusions do not defeat the above referenced evidence establishing that the Salt River was susceptible to navigation

**C. Dr. August's report fails to demonstrate that the lower Salt was not susceptible to navigation.**

Just as Drs. Schumm and Littlefield's reports are flawed by reliance on post-diversion observations, Dr. Jack August's report is similarly flawed. He relies almost entirely on accounts by the Arizona statesman, Carl Hayden, who observed the river after diversions had occurred and commented on the extreme floods. [TR 4/7/2003 at 127:24-129:0] It is not surprising that contemporaneous viewers thought the river was not navigable; however, this ignores the rule from *The Daniel Ball* and *Winkleman*, that navigability is based on the "ordinary and natural" condition, not a diverted/unnaturally depleted condition. Dr. August made no attempt to evaluate the river in a pre-diversion "ordinary" condition although, he admitted, the river was almost entirely diverted by statehood. [*Id.* at 130:17-131:17] His conclusions do not defeat the evidence establishing that the Salt River was susceptible to navigation on the date of statehood

#### **IV. Evidence Related To Potential Segmentation Of The Salt River Was Not Presented To The Commission, And ANSAC Did Not Analyze Segmentation Of The Salt River.**

In *PPL Montana*, the U.S. Supreme Court stated emphatically, it “is well settled” that navigability for title is determined on a segment-by-segment basis. 132 S.Ct. at 1229. “To determine title to a riverbed under the equal-footing doctrine, this Court considers the river on a segment-by-segment basis to assess whether the segment of the river, under which the riverbed in dispute lies, is navigable or not.” *Id.* *PPL Montana* stated that the segments should be “discrete and identifiable,” and the fact-finder should use topography, geography, tributaries, and other physical features to assist in drawing the boundaries of each segment. *Id.* at 1230. This is especially true with longer rivers that traverse vastly different terrain and have changes in flow affected by varying local conditions. *Id.* The river segments must also be large enough to be administrable for title purposes. *Id.* at 1230–31.

Pursuant to A.R.S. § 37-1101 *et seq.*, in 2003 ANSAC published notices in the Arizona Republic announcing that it “intends to receive, review, and consider evidence regarding the navigability or non-navigability of the Lower Salt River between **Granite Reef Dam and the confluence with the Gila River in Maricopa County, Arizona.** [Exhibit A to, REPORT, FINDINGS AND DETERMINATION REGARDING THE NAVIGABILITY OF THE SALT RIVER FROM THE GRANITE REEF DAM TO THE GILA RIVER CONFLUENCE dated September 21, 2005 (“SALT DETERMINATION”) (emphasis added)] Subsequently, ANSAC published notices that it would hold hearings “to receive physical evidence and testimony relating to the Lower Salt River between **Granite Reef Dam and the confluence with the Gila River in Maricopa County.**” [Exhibit B to SALT DETERMINATION (emphasis added)] Plainly, the Notices of Public Hearing make no mention of potential segmentation of the Lower Salt River and leave one with the distinct impression that there could be no alternative segmentation to that contained in the notice. [Id.]

A review of the documents listed on the Evidence Log from the hearings on the Lower Salt and the text of the ANSAC report itself demonstrate that evidence analyzing possible

segmentation of the river in its “ordinary and natural” condition was not presented to ANSAC. [Exhibit E to SALT DETERMINATION] Indeed, there is no apparent reason or evidence supporting the decision to segment the Salt River at Granite Reef Dam rather than the Verde River confluence or any “ordinary or natural” condition that supports the Salt River being split into the Lower and Upper Salt at the unnatural Granite Reef Dam. According to the *PPL Decision*, which requires segmentation to be based on natural features of the watercourse, 132 S.Ct. at 1230, based on the evidence in the record, it makes more sense to include the Verde River confluence with the lower segment and limiting the upper segment to the upstream canyons.

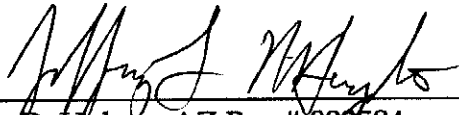
Indeed, even the 37-mile lower Salt reach as presently defined can be readily divided into smaller segments using the *PPL Montana* criteria. While a detailed analysis of segmentation was not performed by anyone, the ASLD Report, states that although the entire reach has similar geomorphic, hydrologic, and hydraulic characteristics, a natural dividing point does exist at Tempe Butte. [EL #30 at 5-1 & 7-1] In the past, shallow bedrock at Tempe Butte forced groundwater to the surface sustaining river flow in the reach immediately downstream from the butte. [*Id.* at 5-8] Early Anglo explorers described the Salt as a perennial stream, 200' wide and 2-3' deep with abundant beaver, fish, and riparian vegetation. [*Id.* at 5-9] Evidently, those early observers saw the river was navigable. Such evidence clearly indicates that natural segmentation remains to be considered.

By selecting an arbitrary starting point (*i.e.*, Granite Reef Dam), ANSAC may in fact be violating *PPL Montana* and *Winkleman*. ANSAC should have re-opened the record to allow interested parties to submit evidence on appropriate segmentation under those conditions. The failure to allow additional evidence, when insufficient notice was provided to the public, denies navigability advocates their due process and ignores the direction given the Commission by the Court of Appeals in *Winkleman*. Nevertheless, based on the evidence in the record, the lower Salt River segment should be extended to include the confluence with the Verde River, a natural tributary, and logical starting point for the reach.

## V. Conclusion

The evidence presented shows that contemporaneous observers viewed the river in an unusual, un-natural condition so any opinions of non-navigability based on that evidence should be given no weight. The only evidence presented about the lower Salt River in pre-settlement, pre-diversion, natural condition was in the ASLD Report and in Hjalmar W. Hjalmarson's report. That evidence of the natural hydrology and physical conditions, along with historical evidence of actual navigation on the river, supports a finding that the river was susceptible to navigation in its "natural and ordinary" condition by a preponderance of the evidence, at least from the confluence with the Verde to the Gila River.

Respectfully Submitted this 7<sup>th</sup> day of September 2012



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**EXHIBIT 1**

## Exhibit 1

### Accounts of Salt River Boating [EL #30 at 3-19]

Year	Account	Source
1873	Two men transported a flat boat loaded with five tons of wheat down the Salt River from Hayden's Ferry to the Swilling Canal, then down the canal to Hellings and Co.'s mill	<i>Weekly Arizona Miner</i> , May 3, 1873
1873	Charles Hayden attempted to float logs down the Salt River and to establish a lumber mill in Tempe, but could not get the logs through the canyons upstream	<i>Weekly Arizona Miner</i> June 14, 21, 28, 1873
1881	Two men (Cotton and Bingham) reported to be planning to travel in an 18-foot, flat-bottom skiff from Phoenix to Yuma by way of Salt and Gila rivers	<i>Arizona Gazette</i> , February 17, 1881
1881	Buckey O'Neill and two others tried to boat from Phoenix to Yuma on the <i>Yuma or Bust</i> , a boat 20 feet long and 5 feet wide	<i>Phoenix Gazette</i> , November 30 and December 3, 1881; McCroskey 1988
1883	Jim Meadows and three other men floated the Salt River between Livingstone (near the present-day Roosevelt Dam) and Tempe	<i>Arizona Republican</i> , October 4, 1909
1883	North Willcox and Dr. G.E. Andrews, U.S.A., floated a canvas skiff from McDowell to Barnum's pier on the Salt River Valley Canal. Report states that the "Salt River is a navigable stream and should be included in the Rivers and Harbors appropriation."	<i>Arizona Gazette</i> , February 14, 1883
1885	In another attempt to see if logs could be floated down the Salt, William Bunch and four other men (listed variously as John Meaders, John Meadows, Lew Robinson, and James Logan) successfully boated the Salt River in a 18'x5' boat from 4 miles above Tonto Creek confluence to Phoenix	<i>Arizona Gazette</i> , June 3, 5, 6, 8, 1885
1888	Major E.J. Spaulding (commandant at Fort McDowell) and Capt. Charles A.J. Hatfield, intending to canoe from Fort McDowell on the Verde River to Phoenix, hunting along the way, made it as far as the Mesa Dam on the Salt River, where Major Spaulding was killed when his gun discharged while lifting the canoe over the Mesa Dam	<i>Phoenix Herald</i> , December 12, 1888; Reed 1977:140
1889	A ferry boat owned by Vol Gentry and W. Cox, "which had been used for years on the Salt River at the Maricopa crossing was floated down the river with the purpose of taking her to the Gila Bend crossing." Forty miles below Phoenix, the boat struck a snag and was cut in two	<i>Tombstone Daily Prospector</i> , January 24, 1889
1890?	According to Scott Soliday, research historian at the Tempe Historical Museum, an article in the <i>Mesa Free Press</i> of 1890 or 1891 describes how, after Fort McDowell was abandoned, A.J. Chandler had logs or	Scott Soliday, personal communication to Douglas Mitchell, 8/12/93



	sawn timber from the fort floated down the Verde and then used in the head gates of the Consolidated Canal. (This article has not been located.)	
1895	Amos Adams and G.W. Evans boated from the San Francisco River to Clifton, then down the Gila to Sacaton. They then hauled the boat overland to Phoenix, and then boated down the Salt and Gila Rivers to Yuma	<i>Phoenix Herald</i> , February 18, 25, 1895
1905	Engineers from the Reclamation Service of the Department of the Interior, appraising the property of the Arizona Water Company, traveled by boat from below the Arizona Dam to the head of the Consolidated canal	<i>Arizona Republican</i> , December 9, 1905).
1905	Jacob Shively built a boat at the Chamberlain Lumber Company in Phoenix, intending to float it to Yuma	<i>Arizona Republic</i> , March 30, 1905
1905	Boat used to rescue people from the flooded Salt River	<i>Arizona Republic</i> , February 5, 1905
1910	Two men took a rowboat trip from Roosevelt Dam on the Salt River to Granite Reef Dam, and then to Mesa via the South Canal	<i>Arizona Republican</i> , June 28, 1910
1915	Boat used to rescue people from the flooded Salt River	<i>Arizona Gazette</i> , January 30, 1915