Santa Cruz River Findings & Conclusions

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BEFORE THE ARIZONA NAVIGABLE STREAM ADJUDICATION COMMISSION

In re Determination of Navigability of the Santa Cruz River	Case No. 03-002-NAV Proposed Findings of Fact and Conclusions of Law regarding the Navigability of the Santa Cruz River

Defenders of Wildlife, Donald Steuter, Jerry Van Gasse, and Jim Vaaler (collectively, "Defenders") hereby submit their proposed findings of fact and conclusions of law regarding the navigability of the Santa Cruz River.

I. Findings of Fact.

A. The Santa Cruz Watershed

1. The Santa Cruz River starts at the southern base of the Canelo Hills, travels south through the San Rafael Valley and then crosses into Mexico. In Mexico it makes a loop of about 30 miles before re-entering the United States six miles east of Nogales. It continues north toward Tucson to the Gila River for a distance of about 225 miles. EIN 6(9); Arizona Stream Navigability Study for the Santa Cruz River, Final Report prepared by SFC Engineering, George V. Sabol, SWCA, Inc. and J. E. Fuller, dated November 1996, Report revised by JE Fuller, January 12, 2004, Section 4, p. 1 (hereinafter "State Report").

2. The channel from the headwaters to the border is shallow. *Id.* Section 4, p. 2.

3. Along the upper Santa Cruz River, the channel is located in an inner valley that was created within broad, dissected pediments and alluvial basin deposits, and flanked by mountains. The channel is well defined, often entrenched. *Id.* at Section 4, Executive Summary, p. i.

4. Near the Santa Cruz/Pima County line, the geology changes from a high bedrock situation to a deep alluvial system and the river would usually sink below the surface, going underground just north of Tubac and resuming perennial surface flow again when it reached the San Xavier Mission. *Id.* at Section 3, p. 7-8.

5. The important hydrological characteristics of the Santa Cruz River that have existed since the predevelopment era are:

a. The Santa Cruz River drained about 533 square miles at the upper end of the study reach and about 8,581 square miles at the lower end. EIN No. X0005 "Navigability Along the Natural Channel of the Santa Cruz River, an assessment based on history, hydrology, hydraulics and morphology" by Hjalmar W. Hjalmarson, PE dated Mar. 20, 2014 ("Hjalmarson Report") at p. 3-4.

b. The watershed was hydrologically diverse because of the diversity of climate, geology and topography. The mountainous areas of the south and central parts of the watershed typically received more than 20 inches of precipitation per year. The hot-dry northern areas typically received less than 8 inches of precipitation per year. *Id.*

c. Precipitation fell during two distinct periods--late summer and midwinter. Some snow accumulated in the higher mountains and typically melted and ran off in the spring. *Id.*

d. When rain fell onto the land in the Santa Cruz River watershed it started moving according to basic principles of hydrology. A portion of the precipitation seeped into the ground to replenish ground water. Some of the water flowed downhill on the land surface as direct runoff and appeared in surface streams that were unaffected by artificial diversions, storage, or other works of man in or on the stream channels. *Id.* at 4.

e. In the Santa Cruz River watershed, most of the runoff from storms reached the river channel directly on the land surface via overland flow, flow in rills, creeks and streams. Direct runoff was seasonal because the storms were seasonal and provided runoff for navigation for part of each year. *Id.*

B. The Santa Cruz River Pre-Development

1. The evidence suggests that before development, ground-water discharge was mainly by evapotranspiration ("ET"), with lesser discharge to streams as base flow. The principal water-bearing sediments consisted of stream-alluvium deposits, where saturated, and upper basin fill. Ground water generally occurred under unconfined conditions, although head differences with depth may have occurred because of the presence of clay lenses in the heterogeneous basin fill. *Id.* at 12.

2. Before development, water levels ranged from at land surface near perennial streams to as much as a few hundred feet below land surface in places near mountain fronts. Ground water flowed from the perimeter of a basin and from the up gradient end toward the

basin center and then down valley to the mouth at the Santa Cruz River. Some ground water probably flowed through the entire length of the basins. *Id.*

3. Under natural conditions, groundwater flowed toward the Santa Cruz River and encountered geologic constrictions and at these places rose above the river bed and became base runoff. In the Marana area (below Rillito Creek and Canada Del Oro) the groundwater basin became large and any groundwater recharge was offset by ET along the river. Below the Picacho Peak area, the groundwater basin became very large and the relatively little amount of recharge was offset by large amounts of ET. The depth to water below Picacho Peak area was shallow and there were large areas of mesquite that transpired great quantities of water. *Id.*

4. Runoff from storms (direct runoff) entered the Santa Cruz River through tributary stream channels all along the watershed. Direct runoff was confined to the Santa Cruz channel and floodplain to the Marana area where high flows would spill onto the floodplain and become separated from the river. Further downstream floodwater entered distributary channels a couple of miles to the south and east of Picacho Peak and spread over a wide area (Santa Cruz Flats). *Id.* Thus, direct runoff was not confined to a single channel between the Picacho Peak area and the mouth at the Santa Cruz River. See *id,* Appendix B, T8S R7E Santa Cruz Flats and Appendix A.

C. Human Impacts on the Santa Cruz River

1. The Santa Cruz River has been the site of settlements since prehistoric times. State Report, Executive Summary, p. 2.

2. The river underwent significant change during the territorial period, from 1850 to 1912. *Id.*, Section 3, pp. 32 – 49.

3. The livestock industry moved into to southern Arizona in the 1880s, and cattle and sheep grazed until much of the valley was denuded. *Id.* at 35.

4. Agriculture also expanded and along the river was characterized by the diversion of surface flows. *Id.* p. 37.

5. When the groundwater table began to drop, cross-cut ditches were dug across the river to intercept shallow subsurface flows. *Id.*

6. Groundwater pumping arrived in Southern Arizona by 1890, and with its advent, the water table began to drop significantly. *Id.*

7. In the 1860s a diversion dam across the Santa Cruz a mile south of "A" mountain created "Silver Lake." *Id.* at 40. The lake was used for milling flour and recreation. Several years later, a second dam was built north of Silver Lake to create Walker Lake. Local residents used the lakes for recreation and boating. *Id.* During this period, however, drought and flood cycles periodically washed out the dams. *Id.* at 43. The dams were rebuilt until February 1890 when flooding washed out the dams and created such entrenchment that neither the dams nor the lakes were rebuilt. *Id.*

8. The entrenchment caused by the combination of factors, cattle, pumping, and diversions, had radically changed the Santa Cruz River. *Id.* at 44-45.

9. By statehood, groundwater pumping had become so prevalent that the river had been significantly altered from its "natural and ordinary condition" and it was virtually impossible for the river to return to its natural condition. *Id.*

10. According to the State Report, "[a]t the time of statehood, the river was probably still perennial – flowing year round – in some of the reaches that had historic surface flow, but intermittent – flowing only during portions of the year – in more areas than previously." State Report, Executive Summary, p. 4.

11. According to the U.S. Geological Survey, essentially the entire flow of surface waters from the river were diverted both at the Nogales and Tucson gaging stations by irrigation ditches. *Id.* Agricultural water use used most of the available surface water and also intercepted groundwater and subsurface flow. *Id.* Diversions and pumping were also impacting tributaries, especially the Rillito River, further diminishing the Santa Cruz River's flow. *Id.*

12. Even though damage from groundwater pumping continued past statehood to modern day, many sections of the Santa Cruz River continued to have perennial flow well after statehood. *Id.* at 7. Even the section of the river near Tucson probably had some perennial flow in 1912, although the river was deeply entrenched. *Id.*

13. Parts of the river remain perennial to this day. *Id.*

D. Historical Descriptions of the Santa Cruz River Prior to and around 1912

1. According to the State Report, "In the early days of exploration and settlement, the upper and middle Santa Cruz River valleys were consistently described as lush or fertile valleys with excellent grazing grounds, abundant grass, occasional forests of huge mesquite trees, and a river lined with giant cottonwoods, walnuts, willows and other riparian species." State Report, Section 3, p. 11.

2. The Treaty of Guadalupe Hidalgo mandated a boundary commission survey to mark the border between the U.S. and Mexico. The Army Corps of Topographical Engineers, under the direction of William H. Emory, did the surveying from 1848 to 1855.

3. In 1852, Emory made numerous observations about the Santa Cruz River that were published in 1857:

> The Santa Cruz River rises in a broad valley, or rather plain, north of the town of the same name. ...Flowing south nine miles to San Lorenzo, a deserted rancho it soon after takes a northerly course, winding its way through a beautiful valley, until it is lost in the desert plain or sands, some ten or fifteen miles north of

> Tucson. Its entire length in a direct line, without reckoning its sinuosities, is about a hundred miles. Its width varies from 20 to 100 feet, and during very dry seasons portions of it disappear.

Hjalmarson Report, Appendix C, item 5.

> In 1857, John Reid described the Upper Santa Cruz as follows:
>
> If you will portray in your imagination a bottom covered with tall, golden colored grass, hedged by mountains whose sand glitter like metal, divided by a meandering stream a dozen yards wide and as many inches deep, this shaded by cotton-woods, willows, and musquites....

State Report, Section 3, pg. 12.

3. Appendix A of the Hjalmarson Report presents the original Federal Land Survey maps (plats) with information, such as channel widths, from selected associated survey field notes for the reach of Santa Cruz River near Picacho to the Mexican border. The maps and survey notes, when used together, provide valuable morphology, hydrology and hydraulic information for the assessment of navigability for ANSAC. Mr. Hjalmarson obtained these maps and field notes from the Bureau of Land Management (BLM) in 2013.

4. The maps and notes reveal that at least as early as the 1870s, there were substantial irrigation diversions from the Santa Cruz River, however, there was still water in the river. For example, the notes from an 1871 river state that there was "plenty" of water in the Santa Cruz, and "the lands along stream are mostly settled upon." Hjalmarson Report, Appendix A at p. 11.

5. Similarly, the federal surveys of 1871-76 describe the width of the river in the Tubac area as between 13 and 33 feet with 3 ditch diversions for irrigation. *Id.* at p. 25.

6. Surveys conducted in late October, early November 1876 in the Tucson area where 1752 acres of fields were surveyed show that water was plentiful and irrigating ditches

were found throughout the fields. There was water to support growing two crops each year. *Id.* at p. 13.

7. By March 30-31, 1915, the channel of the Santa Cruz River was incised 12-20 ft .and the "trench" was from 154 ft. to 317 ft. wide. According to the surveyor, "[t]he Santa Cruz River flows northerly through secs. 22, 23, 26, 35 and 36, and from one-half to one mile on each side is level bottom land; soil 1st rate. The river in this township is from 2.20 to 4.0 chs. wide.[1] The banks at present are well defined – cut banks from 12 to 20 feet high." *Id.* at p. 20.

E. Actual Condition of the Santa Cruz River in 1912

1. By the time of statehood, the river had been significantly altered from its "natural and ordinary condition." According to the State Report, "[a]t the time of statehood, the river was probably still perennial – flowing year round – in some of the reaches that had historic surface flow, but intermittent – flowing only during portions of the year – in more areas than previously." State Report, Executive Summary, p. 4.

2. The gage record indicates that by 1912, the Santa Cruz River at Nogales was no longer perennial but instead had continuous flow during the winter and occasional flow during the spring, summer and fall. Winter discharge averaged about 15 cfs. *Id.*, Section 4 at p. 20.

3. The section near Tucson, however, probably had some perennial flow in 1912 although the river was deeply entrenched. *Id.* Section 3 at p. 5. In fact, the perennial waters near San Xavier persisted until 1949 and supported native fish at least until 1937. *Id.* at 57. There was a deep channel, perhaps more than 20 feet deep, well into what is now the San Xavier Indian Reservation. *Id.* Section 3 at p. 60.

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[1] A chain is 66 feet.

F. Evidence of Navigation.

1. There are numerous documented instances of navigation on the middle segment of the Santa Cruz River. During the 1880's there was boating, fishing and swimming on Silver Lake as well as upstream. *Id.* at 63.

2. Describing the Silver Lake resort, the 1881 City of Tucson Directory advised that the resort offered "several boats for sailing and rowing up the river beyond the lake." *Id.* at 43.

3. Flat bottomed boats launched on Warner's Lake for recreation both on the lake and "up the river." *Id.* at 41.

4. Warner received legal notice that he was interfering with the water in the Santa Cruz and obstructing the "free and continuous passage of the same." *Id.* at 42.

5. There were a few attempts at boating in 1914 during flood conditions, but those were unsuccessful. *Id.* at 63.

6. There are also several accounts of boating using canoes in the middle segment during modern times. *Id.* at 63-64. Although some of these trips have been during high water, not all. Wayne Van Vorhees and his wife traveled the river during the winter of 1989-90 and again in the summer. *Id.* There are no reported instances of boating at any time on the lower Santa Cruz, although during one high flood event, Tucsonan Sam Hughes opined that the river was "big enough to float a steamboat all the way to the sea." *Id.* at 64.

G. The Ordinary and Natural Condition of the Santa Cruz River

1. As discussed above, at the time of statehood, and well before, both the natural hydrology and morphology of the Santa Cruz River had been significantly altered by human activity. Groundwater and surface water removals had resulted in lower flow rates in the Santa

Cruz River than there would be if the River had remained in its ordinary and natural condition. *Id.*

2. In order to determine the "ordinary and natural condition" of the river, it is necessary to eliminate the effect of those impacts. Win Hjalmarson, a retired river engineer from the USGS with 52 years of experience with rivers in the Southwestern United States, undertook such an analysis for the Santa Cruz. See Hjalmarson Report.

3. Mr. Hjalmarson examined available published information and recognized the study could be performed in two basic steps: 1) estimate the amount and temporal distribution of natural flow for the Santa Cruz River; and 2) estimate the natural hydraulic characteristics of the river channel that are related to navigation and apply that to the estimated flow.

4. For the first step, determining the natural hydrology of the river, Mr. Hjalmarson based his analysis largely on two published reports. First, the base runoff was given for groundwater basins along the Santa Cruz in U. S. Geological Survey Hydrologic Investigations Atlas HA-664, 3 sheets. *Id.* at Appendix C, Item 1. Second, the mean annual runoff was defined at key locations by using USBR, 1952, Report on Water Supply of the Lower Colorado River Basin: US Department of Interior, Bureau of Reclamation Project Planning Report, (p. 152), 444 p.; *Id.* at Appendix C, Item 2.

5. Mr. Hjalmarson used these two independent data sources to estimate predevelopment base flow and annual average runoff at 6 separate points on the river: Nogales, Tubac, Continental, Tucson, Cortaro and at river mile 78; *Id.* at 15, Figure 5.[2]

[2] Although not necessary for this analysis, he independently computed the average annual runoff at the mouth of the river using runoff data for other river sites given in the USBR report. He also used transpiration and evaporation published in the same USBR report. This computation was performed because the report by the USBR did not include the runoff at the mouth of the Santa Cruz River and provided useful information for this analysis.

6. Mr. Hjalmarson examined other supportive information that provided hydrologic and hydraulic evidence including field notes for surveys along the Santa Cruz River in the late 1800s and early 1900s by the predecessor agencies of the U. S. Bureau of Land Management. *See id.* at Appendix A.

7. Along with the natural hydrology defined by the USGS and USBR, these original federal land surveys with channel widths at surveyed section boundaries throughout the study reach and general description of hydrologic and geomorphic conditions provided the basis for his conclusion that the lower 78 miles of the Santa Cruz River did not have the streamflow and channel to support navigability. Downstream from Basin 48 (*id.* at Appendix C Item 1 and Figure 6) the flow in the Santa Cruz River became unconfined (See for example *id.* at Appendix B Item 5 and Appendix C Item 1) and large amounts of streamflow entered the ground. *Id.*

8. Conversely, the evidence of the Federal Land Surveys, USGS reports, the USBR report and other reports (for example *id.* at Appendix C, Item 4) shows a defined river channel with perennial/intermittent flow between river mile 78 and 180.

9. Thus, according to Hjalmarson's analysis, navigability ceased at the north end of Basin 48 and the flow in the single channel of the Santa Cruz River is defined by the flow duration curve ("FDC") at river mile 78. *Id.* at 15, Figure 5.

10. Mr. Hjalmarson utilized the FDC to determine the pattern of the annual flow. FDCs are an excellent means of defining the percent of time the natural mean daily discharge was exceeded during a typical or average year. *Id.* at p. 14-15.

11. In a FDC, stream flow discharges are ranked in decreasing order and plotted on a graph. *Id.* at 17. The FDC shows the full range of stream flow for ordinary conditions in a given

river, and also shows the percentage of time that the river's stream flow is at any particular level. *Id.*

12. To determine the general shape of the FDC for the Santa Cruz River, Mr. Hjalmarson used a curve defined by Condes in 1970 using post-development gage data collected at the USGS streamflow gage near Nogales. *Id.* at 15, citing Condes, Streamflow in the Upper Santa Cruz River Basin, USGS WSP 1939-a, 32p. Although post-development discharge data are not an accurate measure of the natural stream flow, Mr. Hjalmarson believed that it sufficiently reflected the range and pattern of the Santa Cruz's stream flow to form the basis of a representative FDC. *Id.*

13. He then applied the FDC to the base runoff and average annual runoff that he calculated for each of the 6 sites, which allowed him to estimate the full range of natural streamflow at each of the identified points in the river. *Id.* at 15, Figure 5; See also Appendix C, Item 3 at p. 7.

14. Once he had determined the natural streamflow, the next step in the process was to apply the information about the River's hydrology to its morphology. *Id.* at 19-24. Mr. Hjalmarson recognized that rivers with natural alluvial channels like the Santa Cruz River construct their own geometries and the hydraulic geometry of the Santa Cruz River was related to the water flow and sediment characteristics. The natural size and shape of the Santa Cruz River channel were defined using hydraulic geometry relations for deformable alluvial channels published by USGS scientist Osterkamp (1980), Sediment-morphology relations of alluvial channels: Proceedings of the symposium on watershed management, American Society of Civil Engineers, Boise *Id.* aho, p. 188-199. *Id.* at 19-20.

15. Once the channel was defined, Mr. Hjalmarson was able to compute channel depth-duration and velocity-duration relations for each of the six sites using a technique based on the standard Manning hydraulics equation for open channel flow. *Id.* at 22. According to these calculations, 75 to 80% of the time, the maximum channel depth at Cortaro ranged from about 2 feet to over 5 feet, with a median depth of 2.5 feet. 80% of the time, the maximum channel depth at Cortaro was 2 feet or greater. At Tucson, the maximum channel depth ranged from two feet to four feet, with a median depth of 2 feet. 100% of the time, the maximum channel depth at Tucson was at least 2 feet. At Continental and Tubac, 75 to 80% of the time, the depths ranged from around 2 feet to almost 4 feet, with a median depth of 2 feet. The maximum channel depth was at least 2 feet 80% of the time at Continental and 100% of the time at Tubac. Finally, at Nogales, the maximum channel depth ranged from around 1.5 feet to 3.5 feet, with a median depth of 2 feet. 100% of the time, the maximum channel depth at Nogales was 1.5 foot or greater. *Id.* at 27, figure 15.

16. Based on this analysis, Mr. Hjalmarson determined that runoff for five reaches in the upper Santa Cruz River watershed have either perennial or ephemeral flow when the river is in its ordinary and natural condition. *Id.*

II. Conclusions of Law.

A. Issue 1: In its Ordinary and Natural Condition, Was the Santa Cruz River Navigable at the Time of Statehood?

1. State ex rel. Winkleman v. ANSAC

1. In the navigability determination of the Lower Salt River, the Arizona Court of Appeals remanded the matter back to ANSAC because it found that "although ANSAC considered a great deal of evidence concerning the condition of the River, and reviewed evidence from various times before statehood, ANSAC ultimately failed to apply the proper legal standard

to the evidence presented." *State ex rel. Winkleman v. Ariz. Navigable Stream Adjudication Comm'n.*, 224 Ariz. 230, 242 p28, 229 P.3d 242, 254 (App. 2010).

2. The Court held that "[b]ecause the proper legal test was not applied, we must vacate the superior court's judgment and remand for ANSAC to consider whether the River would have been navigable had it been in its ordinary and natural condition on February 14, 1912." *Id.* at ¶29.

3. In articulating the proper legal test, the Court instructed that ANSAC is "required to determine what the River would have looked like on February 14, 1912, in its ordinary (i.e. usual, absent major flooding or drought) and natural (i.e. without man-made dams, canals, or other diversions) condition." *Id.* at 241 ¶28, 229 P. 3d at 253.

4. The Court of Appeals also provided specific guidance regarding what constituted the "best evidence" of the Lower Salt's natural condition, and concluded that with respect to that watercourse, "the River could be considered to be in its natural condition after many of the Hohokam's diversions had ceased to affect the River, but before the commencement of modern-era settlement and farming in the Salt River Valley...." *Id.* at 242 ¶30, 229 P. 3d at 254.

5. Although ANSAC's earlier determination regarding the Santa Cruz River was appealed to the Superior Court, the parties agreed to stay that appeal (as well as several others) pending the resolution of the appeal of the Lower Salt River to the Court of Appeals. After the Court of Appeals remanded the Lower Salt matter, the parties all agreed that the stayed appeals should all be remanded as well. Consequently, unlike the adjudication of the Lower Salt River, there is no specific instruction in this case as to what constitutes the "best evidence" of the natural and ordinary condition of this river.

6. In determining navigability for the Santa Cruz River, the inquiry is two-fold. First, the ANSAC must determine what constitutes the best evidence of the river's "natural condition," and second, whether based on that evidence, the river was "used or susceptible to being used...as a highway for commerce, over which trade and travel were *or could have been conducted* in the customary modes of trade and travel on water." A.R.S. §37-1101(5)(emphasis added). *See also, Defenders of Wildlife v. Hull,* 199 Ariz. 411, 18 P. 3d 722 (App. 2001).

2. The Santa Cruz River's Natural Condition.

1. In the case of the Santa Cruz River, there is substantial evidence that on the date that Arizona became a state, February 14, 1912, the river was no longer in its natural condition. See Findings of Fact (FOF) Sections C, D & E.

2. Because the river was no longer in its natural condition in 1912, the question that follows is: at what point in time was the river free from human impacts?

3. As set forth above in the findings of facts, the evidence presented to the Commission establishes that humans have been diverting water from the Santa Cruz River for centuries and that diversion has continued to modern times. FOF, Section C.

4. Although historic accounts have limited evidentiary value, the sedimentary evidence indicates the river was stable. Consequently, Mr. Hjalmarson was able to use hydraulic geometry and morphology to model what the river looked like in its natural condition—before humans began diverting its water and impacting its banks. FOF, Section G.

5. The modeling undertaken by Mr. Hjalmarson uses well-established and accepted scientific methods. *Id.*

6. His analysis demonstrates that in its natural condition, the Santa Cruz River, was largely perennial and from the Mexican border to mile 78, at least 75-80% of the time, it had a depth of at least one foot, with channel widths from 20 to 100 feet. *Id.*

3. The Santa Cruz's Susceptibility to Navigation.

1. The definition of navigability does not require that the watercourse actually have been used for trade or travel, but rather, requires only that it was susceptible to such a use. "The question of ... susceptibility in the ordinary condition of the rivers, rather than of the mere manner or extent of actual use, is the crucial test ... The extent of existing commerce is not the test." *United States v. Utah*, 283 U. S. 64, 82 (1931); *see also, Northwest Steelheaders Ass'n v. Simantel* 199 Ore. App. 471, 112 P.3d 383 (2005), cited with approval in *State ex rel. Winkleman,* 224 Ariz. at 241-42 p28, 229 P.3d at 253-54.

2. The term "highway for commerce" is first found in the definition of "navigable" or "navigable watercourse." The Arizona statute (which codifies federal law) defines both as:

> [A] watercourse that was in existence on February 14, 1912, and at that time was used or was susceptible to being used, in its ordinary and natural condition, as a highway for commerce, *over which trade and travel* were or could have been conducted in the customary modes of trade and travel on water.

Ariz. Rev. Stat. §37-1101(5). The statute more specifically defines "highway for commerce" as "a corridor or conduit within which the exchange of goods, commodities or property *or the transportation of persons* may be conducted." Ariz. Rev. Stat. §37-1101(3). Thus, the statutory definition of "highway for commerce" does not require the transport of goods; the transportation of persons alone is sufficient to establish a "highway for commerce."

17. The term "highway for commerce" can be misleading; as the cases make clear, this requirement is satisfied by either trade or *travel* on the river, even if the travel is noncommercial. As the Arizona Court of Appeals explained in *Defenders,*

> The federal test has been interpreted to neither require both trade and travel together nor that the travel or trade be commercial. *See Utah,* 403 U.S. at 11 (hauling of livestock across lake even though done by owners and "not by a carrier for the purpose of making money" was enough to support a finding of navigability because "the lake was used as a highway and that is the gist of the federal test")

199 Ariz. at 416, 18 P.3d at 727.

18. In *Defenders*, the court also rejected the argument that the trade and travel must be both upstream and downstream, or that the travel must be for a profitable commercial enterprise. Rather, the court observed that, "nothing in the *Daniel Ball* test necessitates that the trade or travel sufficient to support a navigability finding need be from a 'profitable commercial enterprise.'" *Id.* at 422, 18 P. 3d at 733. *See also United States v. Hill,* 248 U.S. 420, 423 (1919) ("commerce has been held to include the transportation of persons and property no less than the purchase, sale and exchange of commodities") *citing Gibbons v. Ogden,* 9 Wheat 1, 188 (1824).

19. As the Oregon Court of Appeals explained in *Northwest Steelheaders*:

> First, with respect to "actual use," it is not necessary that the historic use made of the river have been either widespread or commercially profitable. "The extent of * * * commerce is not the test.". . .. For example, the Court's most recent application of the *The Daniel Ball* test upheld a determination of the navigability of Utah's Great Salt Lake based on evidence that the Court described as "sufficient" but "not extensive."

199 Ore. App. at 389, *quoting Utah v. United States,* 403 U.S. at 11.

20. Further, as the Oregon Court observed, "qualifying travel and trade is not limited to large-scale commercial or multiple passenger vessels of the sort typically engaged in modern commerce." *Id.* at 390. Navigation by small boats has often been recognized as evidence of navigability. Other courts have also recognized the relevance of the historic role of small boats to transport goods in volumes that might seem insignificant by modern standards. *See State of N.D. ex rel. Bd. of Univ., etc. v. Andrus*, 671 F.2d 271, 278 (8th Cir 1982), *rev'd on*

other grounds sub nom, Block v. North Dakota, 461 U.S. 273 (1983)("We must bear in mind that the issue is one of potential commercial use and hence navigability at the time of statehood, not in the present day * * * Canoe travel at the time of North Dakota's statehood represented a viable means of transporting persons and goods."); *Puyallup Tribe of Indians v. Port of Tacoma*, 525 F. Supp. 65 (WD Wash 1981), *aff'd*, 717 F.2d 1251 (9th Cir 1983), *cert den*, 465 U.S. 1049 (1984) (declaring navigability on the basis that "Indians navigated the river with their fishing boats and canoes").

21. The lack of actual use at statehood as a "highway for commerce" does not defeat a finding of navigability. *See, e.g., United States v. Utah*, 283 U.S. at 83. As the United States Supreme Court noted in that case:

> Utah ...is not to be denied title to the beds of such of its rivers...either because the location of the rivers and the circumstances of the exploration and settlement of the country through which they flowed had made recourse to navigation a late adventure, or because commercial utilization on a large scale awaits future demands. The question remains one of fact as to the capacity of the rivers in their ordinary condition to meet the needs of commerce as these may arise in connection with the growth of the population....And this capacity may be shown by physical characteristics and experimentation as well as by the uses to which the streams have been put.

Id. at 83.

22. In considering the issue of "commerce," it is important to distinguish between cases involving navigability under the Commerce Clause and cases involving navigability for title. In Commerce Clause cases, in order to support federal regulatory jurisdiction over power plants the river must by statute be, or have been, "suitable for use for the transportation of persons or property in interstate or foreign commerce." 16 U.S.C. §796(8)(2006). No such "interstate or foreign commerce" requirement exists when the issue is navigability for title. *Oregon v. Riverfront Protective Ass'n*, 672 F.2d 792, 795 n. 1 (9th Cir. 1982). As the Arizona

Court of Appeals cautioned in *Defenders,* "when discussing navigability, any reliance on judicial precedent should be predicated on a careful appraisal of the purpose for which the concept of navigability is invoked." 199 Ariz. 729-30, 18 P. 3d at 418-19.

23. As the United States Supreme Court has observed, "[i]t would be a narrow rule to hold that in this country, unless a river was capable of being navigated by steam or sail vessels, it could not be treated as a public highway." *The Montello*, 87 U.S. (20 Wall) 430, 441 (1874), quoted with approval in *United States v. Utah*, 283 U.S. at 76.

24. The fact that a watercourse is not capable of navigation year round is not a bar to a finding of navigability. In *United States v. Utah*, the Supreme Court provided guidance for evaluating whether periodic conditions of navigation-impairing low flow are extensive enough to constitute the "ordinary condition" of a river and, thus, bar a finding of navigability. In comparing the facts before it to cases in which rivers were found nonnavigable, the Court stated,

> In each of the cases to which the government refers, it was found that the use of the stream for purposes of transportation was exceptional, being practicable only in times of temporary high waters. In the present instance[,] * * * * [the river's] susceptibility of use as a highway for commerce was not confined to exceptional conditions or short periods of temporary high water, *but that during at least nine months of each year the river ordinarily was susceptible to such use.*

283 U.S. at 87 (emphasis added).

25. In *Defenders,* the Arizona Court of Appeals recognized that a river may be found navigable even if it is only navigable a few months out of the year. 199 Ariz. at 422, 18 P. 3d at 733, ("periodic navigability is enough, even if the river is not susceptible to navigation at all seasons of the year or all stages of the water") *citing Economy Light Co. v. United States*, 256 U.S. at 122.

26. "Navigability based on either actual use or susceptibility to use may be established despite the presence of obstacles to free passage, such as rapids, riffles, or occasional

areas of low water requiring portage, so long as the 'natural navigation of the river is such that it affords a channel for useful commerce.'" *Northwest Steelheaders,* 199 Ore. App. at 484, 112 P.3d at 390 *quoting The Montello,* 87 U.S. (20 Wall) at 441.

27. Navigability does not depend on an absence of occasional difficulties in navigation. *Holt State Bank,* 270 U.S. 49, 56 (1926). *See also United States v. Utah,* 283 U.S. at 84, 86 (noting that conditions created by flood deposits of logs and driftwood "do[] not constitute a serious obstacle to navigation" and that, with respect to shifting sandbars in the river channel, "the mere fact of the presence of such sandbars causing impediments to navigation does not make a river non-navigable").

28. Expert testimony regarding historic hydrology may be especially probative of a stream's "ordinary" susceptibility at the time of statehood. *Northwest Steelheaders,* 199 Ore. App. at 485, 112 P.3d at 391.

29. In determining whether a watercourse was "susceptible" of navigation, evidence of modern use is appropriately considered. *PPL Montana LLC v. Montana,* 132 S. Ct. 1215, 1233 (2012)(holding that evidence of present-day, primarily recreational boating can be considered provided it is "confined to that which shows the river could sustain the kinds of commercial use that, as a realistic matter, might have occurred at the time of statehood."); *see also Winkleman v. ANSAC,* 224 Ariz. at 242 ¶31, 229 P.3d at 254. ("Even if evidence of the River's condition after man-made diversions is not dispositive, it may nonetheless be informative and relevant.").

30. A. party seeking to use present-day evidence for title purposes must show: (1) the watercraft are meaningfully similar to those in customary use for trade and travel at the time of statehood; and (2) the river's post-statehood condition is not materially different from its

physical condition at statehood or the river has not changed in ways that substantially improve its navigability. *PPL Montana,* 132 S. Ct. at 1233.

31. In the case of the Santa Cruz River, there is evidence of actual navigation both prior to statehood and after, even though at the time that is occurred, the river was not in its natural condition.

32. The evidence supports a finding that the river would have been susceptible to navigation in its natural condition. FOF, Section F.

33. As part of his assessment, Mr. Hjalmarson evaluated the Santa Cruz River in its ordinary and natural condition for navigability. *Id.*

34. Mr. Hjalmarson evaluated the navigability of the 102 mile reach of the Santa Cruz River downstream from the Mexican border by using two relatively simple independent methods used by federal agencies to determine whether a watercourse is capable of being navigated by various water craft. Hjalmarson Report at p. 26, 35 (citing U.S. Fish and Wildlife Service Arizona Game and Fish Department Chapter 10 Santa Cruz River Watershed, January 2011, 86 p. and U. S. Bureau of Outdoor Recreation, 1977, Flow requirements, analysis of benefits, legal and institutional constraints: Recreation and Instream Flow, Vol. 1, 20p.).

35. Mr. Hjalmarson first applied the "Bureau of Outdoor Recreation Method" developed in 1977 for the Bureau of Outdoor Recreation of the U.S. Department of Interior.

36. Second, he used the Fish and Wildlife Service Method. This latter is a single cross section technique that is very simple to use and is based on a minimum flow recommended for a particular watercraft activity. The USFW method establishes minimum depth and width requirements for canoes, kayaks, drift and row boats.

37. Mr. Hjalmarson found, all of these minimum requirements are met from the U.S./Mexico border to Mile 78 of the Santa Cruz River in its natural and ordinary condition. His specific finding regarding the navigability characteristics of the Santa Cruz River are as follows:

> It is my opinion the Santa Cruz River, from river mile 78 (boundary of sections 9 and 10, T10S R9E in the Red Rock-Picacho Peak area at boundary of alluvial basins 48 and 49) to the Mexican border (mile 180), was susceptible to navigation at the time of statehood (February 14, 1912) in its natural condition. During ordinary years the river was susceptible to navigation 75% of the time.

Hjalmarson Report, p. 30.

38. In December 2008, the Army Corps of Engineers determined that two reaches of the Santa Cruz River, Study Reach A from the Tubac gage station to the Continental gage station and Study Reach B from the Roger Road wastewater treatment plant downstream to the Pima/Pinal County line, are "Traditional Navigable Waters" (TNW). See Determination dated May 23, 2008, EIN X003. In making that determination, the Corps found that the two reaches, "have the potential to be used for commercial recreational navigation activities, such as canoeing, kayaking, birding, nature and wildlife viewing. Such attractions and activities demonstrate that the Study Reaches may be susceptible to use in interstate commerce." *Id.* at p. 5.

39. Because the modern day river has significantly reduced flow and, therefore, is less (not more) susceptible to navigation than the river in its ordinary and natural condition would have been at the time of statehood, evidence of modern boating is relevant and supports a finding that a significant segment of the river in its ordinary and natural condition could have been navigated with canoes or drift boats.

B. Issue 2: Segmentation.

40. The United States Supreme Court held that a river's navigability must be determined on a segment-by-segment basis. *PPL Montana LLC v. Montana,* 132 S. Ct. 1215 (2012).

41. The Court recognized that "[p]hysical conditions that affect navigability often vary over the length of a river." *Id.* at 1230.

42. It would be contrary to well-established federal law to find an entire river "nonnavigable" simply because portions of the river were not susceptible to navigation, when others clearly were.

43. As Mr. Hjalmarson has opined, although he applied his model to the entire reach of the Santa Cruz, he determined that at mile 78 the maximum depth of the river in its natural condition most likely would not have been susceptible to navigation. Therefore, he recommended segmenting the Santa Cruz at that point. Hjalmarson Report, p. 29.

III. Conclusion.

44. The evidence presented demonstrates that a significant segment of the Santa Cruz River meets the Arizona and federal standards of navigability. Evidence of navigability includes the early perennial flow of the river, historic descriptions of the river, the sedimentary evidence in the river banks, the modeled width and depth of the river in its natural condition, incidents of modern boating, and established flow requirements for actual navigation.

45. When the objective evidence submitted is evaluated in light of the appropriate standard, it is clear that at the time of statehood the Santa Cruz, in its ordinary and natural condition, was susceptible for use as a highway for commerce, over which trade and travel could be conducted in the customary modes of trade and travel from the U.S./Mexico border to mile 78.

Respectfully Submitted this 3rd day of July, 2014.

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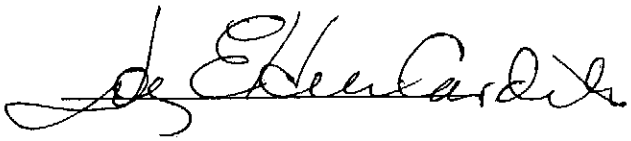

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BEFORE THE ARIZONA NAVIGABLE STREAM ADJUDICATION COMMISSION

IN RE: DETERMINATION OF NAVIGABILITY OF THE SANTA CRUZ RIVER

Case No. 03-002-NAV

FREEPORT MINERALS CORPORATION'S PROPOSED FINDINGS OF FACT AND CONCLUSIONS OF LAW

Freeport Minerals Corporation (Freeport) hereby submits its proposed findings of fact and conclusions of law in this matter regarding the Santa Cruz River. References herein to the transcription of the tape recordings of the evidentiary hearing held on March 28, 2014 are set forth as "Trans. __ of 4 p. __ (Burtell)." A table of contents appears on page i. Freeport's proposed findings of fact begin on page 1. Freeport's proposed conclusions of law begin on page 17.

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FINDINGS OF FACT

I. SUMMARY OF EVIDENCE SUBMITTED

1. The Arizona State Land Department (SLD) retained a technical consultant to study and prepare a report concerning the Santa Cruz. *See* Arizona Stream Navigability Study for the Santa Cruz River, J.E. Fuller, dated January 12, 2004, Exhibit 19, (Fuller Report).

2. The Commission previously held public hearings concerning the Santa Cruz on March 11, 2003 in Nogales, on January 22, 2004 in Tucson, and on March 9, 2004 in Florence. Each of these hearings was properly noticed pursuant to the applicable statutes.

3. All parties were advised that anyone who desired to appear and give testimony at the public hearing could do so and, in making its findings and determination as to navigability and non-navigability, the Commission would consider all matters presented to it at the hearing, as well as other historical and scientific data, information, documents and evidence that had been submitted to the Commission at any time prior to the date of the hearing, including all data, information, documents and evidence previously submitted to the Commission. All parties were advised that they could file post-hearing memoranda.

4. On September 16, 2004, at a public hearing in Phoenix, Arizona, after considering all of the evidence and testimony submitted and the post-hearing memoranda filed with the Commission, and the comments and oral argument presented by the parties, and being fully advised in the premises, the Commission, with a unanimous vote, found and determined in accordance with A.R.S. § 37-1128 that the Santa Cruz River from the Mexican border to the confluence with the Gila River in Santa Cruz, Pima and Pinal Counties, Arizona, was non-navigable as of February 14, 1912. *See* Report, Findings and Determination Regarding the Navigability of the Santa Cruz River from the Mexican Border to the Confluence with the Gila River, dated October 18, 2006.

5. Subsequent to the Arizona Court of Appeals' decision in *State v. Arizona Navigable Stream Adjudication Com'n*, 224 Ariz. 230, 229 P.3d 242 (App. 2010) ("*State v. ANSAC*") concerning the Lower Salt River, the parties agreed that the issues relating to the six watercourses on which judicial appeals were then pending (Lower Salt, Upper Salt, Gila, Verde, San Pedro, and Santa Cruz) should be remanded to the Commission for further proceedings consistent with the appellate opinion.

6. The Commission expressed its intent and willingness to receive additional evidence and testimony on two issues: (1) navigability or non-navigability of each respective river in its "ordinary and natural condition" at the State of Arizona's admission to the United States on February 14, 1912, consistent with the Arizona Court of Appeals decision in *State v. ANSAC*; and (2) segmentation of each respective river consistent with the United States Supreme Court's decision in *PPL Montana, LLC v. Montana*, 132 S.Ct. 1215 (2012).

7. On March 28, 2014, the Commission conducted another properly noticed hearing concerning the Santa Cruz in Tucson.

8. Again, all parties were advised that anyone who desired to appear and give testimony at the public hearing could do so and, in making its findings and determination as to navigability and non-navigability, the Commission would consider all matters presented to it at the hearing or at any time prior to the date of the hearing, including all data, information, documents and evidence previously submitted to the Commission. The record was kept open until April 15, 2014 for the submission of any additional evidence. All parties were also advised that they could file post-hearing memoranda and proposed findings of fact and conclusions of law.

9. Freeport's expert witness, Rich Burtell, PG, was the only witness to testify before the Commission during the March 28, 2014 hearing.

10. Mr. Burtell prepared a declaration, included in the Commission's record as

Item No. X004, and testified in support of his findings that the Santa Cruz was not navigable in its ordinary and natural condition on or before statehood. Declaration of Rich Burtell on the Non-Navigability of the Santa Cruz River at and Prior to Statehood, dated October 2013, Item No. X004, Freeport 1 (Burtell Declaration).

11. No court reporter was present for the March 28, 2014 hearing, but transcriptions were prepared of the audio tapes that were recorded during the hearing, and the transcriptions are part of the Commission's record.

12. The Arizona Center for Law in the Public Interest (Center) submitted a report by Hjalmar W. Hjalmarson. However, Mr. Hjalmarson did not testify during the March 28, 2014 hearing. No proponent of navigability called any witness to testify at the March 28, 2014 hearing.

13. Mr. Hjalmarson's report is entitled "Navigability along the Natural Channel of the Santa Cruz River" and is included in the Commission's Record as Item No. X005 (Hjalmarson Report).

14. In his report, Mr. Hjalmarson does not opine that either the Upper Santa Cruz or the Lower Santa Cruz was navigable, only the Middle Santa Cruz. *See* Trans. 1 of 4 p. 11 (Burtell).

15. Accordingly, it is uncontested that neither the Upper Santa Cruz, from its headwaters in the Canelo Hills to the international border, nor the Lower Santa Cruz, from river mile 78 to the confluence with the Gila River, was navigable in its ordinary and natural condition at or before statehood.

16. The Middle segment analyzed by Mr. Hjalmarson extends from the international border to river mile 78 in the Picacho Peak area. The Middle segment analyzed by Mr. Burtell extends from the international border to the Santa Cruz Flats.

17. T.A.J. Gookin prepared a report on behalf of the Gila River Indian Community. Mr. Gookin did not testify during the March 28, 2014 hearing. In his

report, Mr. Gookin opines that the Santa Cruz was not navigable in its ordinary and natural condition on or before statehood. Mr. Gookin's report is titled "Navigability of the Santa Cruz River" and is included in the Commission's Record as Item No. X007 (Gookin Report).

II. HISTORY OF THE SANTA CRUZ

18. The Commission finds, as a matter of fact, that the historical evidence in the record before it relating to the Santa Cruz shows that the Santa Cruz was not actually navigated, nor was it susceptible to navigation, in its ordinary and natural condition. *See* Findings and Conclusions, *infra*.

19. The Santa Cruz River Valley has been a center for travel, commerce, settlement, and agricultural activities for thousands of year. However, no archeological evidence has been found to suggest that early inhabitants used boats on the river. *See* Fuller Section 2 p.43 and Section 3 p.4; Burtell Declaration ¶ 41.

20. The Commission finds, as a matter of fact, that there is no history of commercial navigation or other boating of the Santa Cruz during prehistoric times or by early inhabitants.

III. THE UPPER SANTA CRUZ WAS NOT NAVIGABLE IN ITS ORDINARY AND NATURAL CONDITION AT OR BEFORE STATEHOOD.

21. The Upper Santa Cruz is the portion of the Santa Cruz River flowing from its headwaters in the Canelo Hills in Arizona to the international border with Mexico.

22. No party has argued that the Upper Santa Cruz was navigable in its ordinary condition at or before statehood. Nor has any party offered any evidence supporting a finding that the Upper Santa Cruz was navigable in its ordinary condition at or before statehood.

A. Historical Accounts Concerning the Upper Santa Cruz

23. Two residents of the area surrounding the Upper Santa Cruz provided

testimony in the 1880s concerning the occurrence of water in the Upper Santa Cruz during the 1830s and 1840s. Burtell Declaration ¶¶ 17-20; Trans. 1 of 4 pp. 11-12 (Burtell).

24. Their testimony indicated that during this time, during a period of Apache unrest when diversions in the area, if any, were only minor, the stream's flow was extremely sporadic, with repeated gaps in flow, and consisted of only a mile or two of perennial flow. Burtell Declaration ¶¶ 17-20; Trans. 1 of 4 pp. 11-12, 15 (Burtell).

B. Stream Flow Records Concerning the Upper Santa Cruz

25. According to stream flow data collected between 1948 and 2012 at the U.S. Geological Survey (USGS) gage near Lochiel along the Upper Santa Cruz, the median discharge was less than one cubic foot per second (CFS) for each month, which corresponds to less than one foot of depth. Burtell Declaration, Table 1.

26. Rich Burtell noted at the March 28, 2014 hearing that the diversions associated with USGS-reported irrigation in the vicinity of the Lochiel gage amount only to a couple of CFS, meaning that predevelopment flows would have been less than 5 CFS. Trans. 1 of 4 p. 12 (Burtell).

27. Mr. Burtell described this extremely small discharge rate in comparison to rivers that actually are navigable:

> ... I have been to the gauge site. When you look at the actual stream it's not much wider than this desk, at Lochiel...at the Lochiel gauge, and half a foot at most depth. In fact, often less than that. You compare to that to the streams that have been deemed navigable, let's say the Green River or the Grande [sic] River in Utah, those rivers ... the average or typical flow is on the order of thousands of CFS, 2,000, 5,000 CFS. We are talking a stream here that is less than 10 CFS. So, we are talking two orders of magnitude lower flow.

Trans. 1 of 4 p. 13 (Burtell).

C. History of Commercial Navigation of the Upper Santa Cruz

28. There is no history of commercial navigation of the Upper Santa Cruz, or any other navigation for that matter. Trans. 1 of 4 p. 16.

29. The Commission finds, as a matter of fact, that Mr. Burtell's testimony concerning the Upper Santa Cruz was credible.

30. The Commission finds, as a matter of fact, that the evidence that Mr. Burtell relied upon was credible, as were Mr. Burtell's methods for evaluating the evidence and his conclusions and opinions based upon this evidence.

31. Based upon the evidence submitted and its review of the applicable law, the Commission finds that the Upper Santa Cruz was neither used nor susceptible to being used for navigation in its ordinary and natural condition on or before February 14, 1912. Therefore, it is not and was not "navigable" as defined by the Arizona statute and the federal case law.

IV. THE MIDDLE SANTA CRUZ WAS NOT NAVIGABLE IN ITS ORDINARY AND NATURAL CONDITION AT OR BEFORE STATEHOOD.

A. Mr. Hjalmarson's Evaluation of the Middle Santa Cruz

32. Mr. Hjalmarson relied upon a mathematical model involving a series of calculations to attempt to determine the depth of the Santa Cruz in its ordinary and natural condition. *See generally* Hjalmarson Report.

33. Mr. Hjalmarson's methodology for evaluating the Middle Santa Cruz is the same general methodology that he employed in concluding that most of the San Pedro River was navigable in its ordinary and natural condition. Trans. 1 of 4 pp. 2-4 (Burtell).

34. Mr. Hjalmarson assumed that one foot of maximum depth was sufficient for navigability in reliance upon a set of recreational boating standards specifying the minimum depths required for modern recreational canoes. Hjalmarson Report pp. 26-27 (chart showing required depths for recreational craft) (relying on Hyra, R., 1978, Methods of assessing instream flows for recreation: Instream Flow Information Paper No. 6, U.S. Fish and Wildlife Service and others); Trans. 1 of 4 p. 2 (Burtell).

35. Mr. Hjalmarson did not apply the conclusions that he derived from his

model to commercial uses or commercial watercraft. *See generally* Hjalmarson Report.

36. The Commission finds that the Center has failed to meet its burden to demonstrate that these recreational standards, and the modern recreational craft to which they correspond, have any applicability to the craft customarily used for trade and travel at the time of statehood. *See, e.g., PPL Montana*, 132 S.Ct. at 1234 ("At a minimum, ... the party seeking to use present-day evidence for title purposes" must show that "(1) the watercraft are meaningfully similar to those in customary use for trade and travel at the time of statehood; and (2) the river's post-statehood condition is not materially different from its physical condition at statehood.").

37. The Commission finds, based upon the testimony and other evidence submitted by the parties, that the modern recreational craft to which the modern recreational standards apply are not meaningfully similar to those in customary use for trade and travel at the time of statehood. *See, e.g.,* Special Master's Report pp. 117-18 (describing the drafts of various craft that were customarily used for trade and travel) and 167 (determining that these crafts could be navigated on the Green River and the Colorado River, but that they could not be navigated on the San Juan, despite the river having depths between one and three feet "for 219 days" each year, and for the other "146 days a depth of over three feet.").

38. The Commission finds, based upon the testimony and other evidence submitted by the parties, that modeling was unnecessary because there is a significant amount of historical empirical data that is more reliable. *See* Findings of Fact, below. The Commission also finds, as discussed below, that Mr. Hjalmarson's model is flawed in multiple respects and does not calibrate to actual empirical data, and that the model is therefore unreliable.

39. Mr. Hjalmarson's analysis and opinions are based upon the assumption that the Middle Santa Cruz has a smooth, uniform parabolic channel. Trans. 3 of 4 pp. 2, 4

(Burtell). The Commission finds, based on the evidence presented by the parties, that this is not a valid assumption. Trans. 1 of 4 p. 16 (Burtell); Trans. 2 of 4 pp. 3-5 (Burtell); Trans. 3 of 4 pp. 4 (Burtell).

40. Mr. Hjalmarson input his discharge figures into an equation for determining the width of the active channel, and Mr. Burtell described how the width equation significantly underestimates the width of the active channel. Trans. 1 of 4 pp. 2-4 (Burtell); Trans. 3 of 4 pp. 3-4 (Burtell).

41. The Commission finds, based upon the testimony and other evidence submitted by the parties, that by underestimating width – i.e. constraining the same amount of discharge to a narrower cross-section – Mr. Hjalmarson necessarily overstated the depth. Trans. 3 of 4 pp. 5-6 (Burtell).

42. Mr. Hjalmarson's analysis assumes that the deepest part of the channel is exactly in the middle of the river, and that was not uniformly true for the Santa Cruz in its ordinary and natural condition. To the contrary, the evidence reflects that the Santa Cruz's channel is highly variable, and navigability is undermined when conditions require the person to be able to ascertain precisely where the deepest point of the channel resides. Gookin Report Ch. VI pp. 1-2.

43. From a scientific perspective, when employing a model it is important to calibrate the results to evaluate whether the model renders reliable results, yet, as Mr. Burtell described, Mr. Hjalmarson did not make appropriate efforts to calibrate his model. Trans. 3 of 4 pp. 3-4 (Burtell); *see also* Gookin Report Ch. V pp. 1, 14.

44. Mr. Hjalmarson created a flow duration curve for the Middle Santa Cruz derived from flow data at the Nogales gage, where flow is more regular than many other portions of the Middle Santa Cruz. Mr. Hjalmarson then superimposed this flow duration curve across the entire Middle Santa Cruz, which included numerous ephemeral stretches in its ordinary and natural condition. This approach led to unreliable results, such as the

conclusion that ephemeral reaches, which in reality flow only in direct response to storm events, have flow 90% of the time. Trans. 2 of 4 p. 18-19 (Burtell); *see also* Gookin Report Ch. IV pp. 7-9; Center's Memorandum regarding the Navigability of the Santa Cruz River, dated September 7, 2012, pp. 12-13 ("Near the Santa Cruz/Pima County line, the geology changes from a high bedrock situation to a deep alluvial system and the river would usually sink below the surface, going underground just north of Tubac and resuming perennial surface flow again when it reached the San Xavier Mission.").

45. The Commission finds that, as Mr. Burtell described in his testimony, Mr. Hjalmarson's model does not calibrate to real world empirical data, and that the model is therefore unreliable.

46. The Commission appreciates the effort that Mr. Hjalmarson spent in attempting to analyze the depth of the Middle Santa Cruz, from the international border to the Picacho Peak area, in its ordinary and natural condition. The Commission finds, however, as a matter of fact, (a) that his conclusions are contrary to the numerous historical observations of the river in its ordinary and natural condition and the stream flow data that was adjusted for diversions, and (b) that even aside from this contrary evidence, the methodological limitations and assumptions necessary for his techniques show that his analysis does not support his conclusions regarding the estimated depth of the Middle Santa Cruz in its ordinary and natural condition.

B. Historical Accounts Concerning the Middle Santa Cruz

47. Historical accounts by missionaries, military personnel, surveyors, and 49ers exist from a time when the Santa Cruz remained in its ordinary and natural condition. Trans. 1 of 4 pp. 17-18; *see also* Burtell Declaration, Table 2.

48. For the Middle Santa Cruz, Mr. Burtell examined accounts made from 1849 through the late 1850s, because these were periods of significant Apache unrest during which travelers noted that the region was essentially abandoned. *See* Trans. 1 of 4 pp.

18-19 (Burtell); Declaration ¶¶ 26-31 and Table 2.

49. Mr. Burtell also identified other historic accounts made during the autumn harvest or during winters when there was little or no irrigation ongoing. *See* Trans. 1 of 4 p. 18 (Burtell).

50. Because these periods involved little if any agricultural or other cultural diversions, these historic accounts provide a record of the Middle Santa Cruz in its ordinary and natural condition. *See* Trans. 1 of 4 pp. 18-19 (Burtell); Declaration ¶¶ 26-31 and Table 2.

51. The historic accounts of the Middle Santa Cruz in its ordinary and natural condition demonstrate that the stream included multiple discontinuous stretches. For instance, the stream flowed through Calabasas and went dry a few miles north of Tubac. *See* Trans. 1 of 4 pp. 18-19 (Burtell); Burtell Declaration ¶ 29 and Table 2. From that point, the Middle Santa Cruz went "underground all the way to San Xavier del Bac. Only during years of exceptionally heavy rainfall does it water the flat land between Tubac and San Xavier." Burtell Declaration Table 2 at account by Zuniga in 1804; Trans. 1 of 4 p. 19 (Burtell); Burtell Declaration ¶ 29.

52. This ephemeral stretch of the Middle reach is approximately 20 miles in distance, meaning that travel north from the Tubac area would, under ordinary and natural conditions, require an onerous 20 mile portage.

53. In addition to a series of gaps in flow, even where flow did exist in the absence of heavy rainfall the stream was small and very shallow, typically one foot or less. Burtell Declaration ¶ 29 and Table 2.

54. Indeed, "[t]he river was much too shallow most of the time for small boats, even in the perennial stretches." Fuller Report p. 12.

55. In the Calabasas area, for instance, it was noted that the Santa Cruz was a mere twelve inches deep. Burtell Declaration Table 2 at account by Reid in February

1857.

56. Once water reappeared in the San Xavier area after the long twenty mile ephemeral reach beginning north of Tubac, the stretch between San Xavier to Tucson was a small stream unfit for commercial navigation. Burtell Declaration Table 2 at account by Powell in October 1849.

57. For example, in October 1849, during the fall harvest, one commentator noted when traveling from San Xavier to Tucson that "[t]he river ha[d] divided to a mere brook, the grassy banks of which are not more than two yards apart." Burtell Declaration Table 2 at account by Powell in October 1849.

58. In the Tucson area, the stream was described in February 1854 as being merely a foot in depth. Burtell Declaration Table 2 at account by Parke in February 1854.

59. North of Tucson, the series of repeated gaps in flow continued through the end of the Middle at Santa Cruz Flats. Burtell Declaration Table 2 at accounts by Cook, Manje, and Font in December 1846, November 1697, and October 1775, respectively.

60. The Santa Cruz was a very important transportation corridor for travelers going from the eastern United States to the west, or from Mexico to the Gila River, yet there is no evidence of commercial trade on the river. Fuller Report p. 12.

61. The Commission finds, as a matter of fact, that the foregoing historic accounts reflect the Middle Santa Cruz in its natural and ordinary condition. The Commission also finds that the stream depths depicted by this evidence demonstrate that the Middle Santa Cruz was not susceptible to being used for commercial navigation in its natural and ordinary condition.

C. Stream Flow Records Concerning the Middle Santa Cruz

62. Mr. Burtell evaluated stream flow records from the USGS gage near Nogales, which included flow data for over 150 months from 1913 to 1920 and from 1930 to 1939. Burtell Declaration ¶ 32; Trans. 2 of 4 pp. 3-4.

63. The USGS had determined the number of acres being irrigated upstream of the gage during these periods and had measured the other diversions that were made through an irrigation canal. Burtell Declaration ¶ 35; Trans. 2 of 4 pp. 3-4, 9.

64. Mr. Burtell determined that these upstream diversions reduced the stream flow at the Nogales gage by only about five CFS, and he was therefore able to account for the diversions to ensure that his analysis applied to the Middle reach in its ordinary and natural condition. *See* Trans. 2 of 4 pp. 3-4, 9 (Burtell); *see also* Burtell Declaration at Tables 3 and 4.

65. Based upon this measured, empirical data, there were only four months – out of more than 150 months – during which the average stream depths were greater than a foot. *See* Trans. 2 of 4 pp. 8-9 (Burtell); *see also* Burtell Declaration ¶¶ 33-36 and Table 4.

66. Adding in tens, or even hundreds, of additional CFS of flow into the river would not have resulted in depths sufficient to support commercial navigation. *See* Trans. 2 of 4 pp. 9-10 (Burtell); *see also* Burtell Declaration at Tables 3 and 4.

67. The Commission finds, as a matter of fact, that the stream flow data which Mr. Burtell adjusted for depletions reflect the Middle Santa Cruz in its natural and ordinary condition. The Commission also finds that the stream depths depicted by this evidence demonstrate that the Middle Santa Cruz was not susceptible to being used for commercial navigation in its natural and ordinary condition.

D. History of Commercial Navigation of the Middle Santa Cruz

68. There is no history of commercial navigation of the Middle Santa Cruz, or any other navigation for that matter, in its ordinary and natural condition. *See, e.g.,* Trans. 1 of 4 pp. 17-18; Fuller Report p. 12 ("the Santa Cruz was "a *very important transportation corridor* for travelers going from the eastern United States to the west, or from Mexico to the Gila River," yet "[t]here is *no evidence of commercial trade on the*

river.").

69. The only history of boating on the Middle Santa Cruz involved boating in man-made lakes, Silver Lake and Warner Lake, which existed along the Santa Cruz in the late 1800s and early 1900s, or modern recreational tubing, kayaking, and rafting in effluent dominated reaches downstream of wastewater treatment plants or during storm events. *See* Burtell Declaration ¶¶ 46-52.

70. The Commission finds, as a matter of fact and law, that these excursions were recreational nature and are not indicative of "the kinds of commercial use that, as a realistic matter, might have occurred at the time of statehood." *PPL Montana*, 132 S. Ct. at 1233; *see also Id.* at 1243.

71. Neither man-made lakes nor the introduction of effluent to the streambed represent the Santa Cruz in its natural condition, and storm events do not represent the Santa Cruz in its ordinary condition. As the Arizona Court of Appeals provided in *State v. ANSAC*, "[t]he crucial question" is whether a river "was navigable in its ordinary and natural condition," 224 Ariz. at 234, 229 P.3d at 246, ¶ 1, and the Santa Cruz's natural condition is absent man-made alterations to a river, and its ordinary condition is absent unusually high flow during a storm event. *Id.* at 241, 229 P.3d at 254, ¶ 28 (construing "ordinary" to mean "usual, absent major flooding or drought" and "natural" to mean "without man-made dams, canals, or other diversions.").

72. The Center entered information into the record concerning the Army Corp of Engineers' determination that portions of the Santa Cruz River constitute traditional navigable waters for purposes of administering the Clean Water Act. *See* Memorandum for the Record regarding Determination of Two Reaches of the Santa Cruz River as Traditional Navigable Waters, Item No. X003, (TNW Determination). The Commission finds that the analysis supporting the TNW Determination does not support a finding of navigability for title under *The Daniel Ball* test. *See* TNW Determination; *see also* E-mail

from Thomas Magness to Steven Stockton dated June 30, 2008, Item No. X008, Freeport 8 (E-mail from Thomas Magness). For instance, the TNW Determination relied heavily upon flow that exists as a result of the introduction of effluent to the stream, *see* E-mail from Thomas Magness, which does not represent the Santa Cruz River in its natural condition. *See, e.g., State v. ANSAC*, 224 Ariz. at 241, 229 P.3d at 254, ¶ 28. Based on the foregoing, the Commission finds, as a matter of fact and law, that the TNW Determination is inconsistent with *The Daniel Ball* test and that it has no bearing on the Commissions analysis or ultimate determinations in these proceedings.

73. While the absence of commercial navigation is not dispositive "where conditions of exploration and settlement explain the infrequency or limited nature of such use," *United States v. Utah*, 283 U.S. 64, 82, 51 S. Ct. 438, 443 (1931), the evidence demonstrates that there were significant needs for commercial navigation to supply mining operations and military bases, including the Tucson Presidio, Fort Buchanan, and a base in the Tubac area, which were all forced to obtain supplies by wagon train from Guaymus or Yuma. *See* Trans. 2 of 4 p. 11; *see also* Gookin Report Ch. III pp. 1-2.

74. The record demonstrates that the Santa Cruz was "a very important transportation corridor for travelers going from the eastern United States to the west, or from Mexico to the Gila River," yet "[t]here is no evidence of commercial trade on the river." Fuller Report p. 12.

75. The Commission finds, as a matter of fact, that the "conditions of exploration and settlement" do *not* explain the absence of commercial navigation, because there is a long history of inhabitation of the Santa Cruz Valley and clear needs for commercial navigation during times when diversions, if any, were minimal.

76. The Commission finds that the historical accounts, stream flow records, and absence of history of navigation despite significant needs for commercial navigation all indicate that the Middle Santa Cruz was not susceptible to use as a highway of commerce

in its ordinary and natural condition.

77. The Commission finds, as a matter of fact, that Mr. Burtell's testimony concerning the Middle Santa Cruz was credible.

78. The Commission finds, as a matter of fact, that the evidence that Mr. Burtell relied upon was credible, as were Mr. Burtell's methods for evaluating the evidence and his conclusions and opinions based upon this evidence.

79. Based upon the evidence submitted and its review of the applicable law, the Commission hereby finds that the Middle Santa Cruz was neither used nor susceptible to being used for navigation in its ordinary and natural condition on or before February 14, 1912. Therefore, it is not and was not "navigable" as defined by the Arizona statute and the federal case law.

V. THE LOWER SANTA CRUZ WAS NOT NAVIGABLE IN ITS ORDINARY AND NATURAL CONDITION AT OR BEFORE STATEHOOD.

80. No party contends that the Lower Santa Cruz is navigable, and the evidence demonstrates that this reach was not navigable in its ordinary and natural condition.

81. The Center has acknowledged that "the lower Santa Cruz River in Pinal County, never support[ed] perennial flows," that "[i]t is only during flood times that the river flows continuously to the Gila River," and that "[t]here are no reported instances of boating at any times on the lower Santa Cruz." Trans. 2 of 4 p. 16 (Burtell) (quoting the Center's Memorandum regarding the Navigability of the Santa Cruz River, filed on September 7, 2012 (Center's September 2012 Memorandum)).

82. The dryness of the Lower Santa Cruz is underscored by the travels of Father Eusebio Kino. In an effort to stay near water, Father Kino and his companions retreated from the Lower Santa Cruz and charted a course towards the Gila River, which was the nearest source of water. This same course was later followed by subsequent explorers, up through the 49ers' travel towards California. The reason for parting from the Lower Santa

Cruz was simple – it did not contain any water. Trans. 2 of 4 p. 16-17 (Burtell); Burtell Declaration ¶¶ 55-56.

83. Not only is the Lower Santa Cruz merely ephemeral, but the majority of this reach is not even considered a river. The Lower is instead referred to at its point of beginning as Santa Cruz Flats and, farther north, as Santa Cruz Wash. Burtell Declaration at Figure 1 and Table 6; Trans. 1 of 4 p. 10 (Burtell).

84. It is only during flood times that the Lower Santa Cruz even flows continuously into the Gila River, and there are no reported instances of boating at any times on the Lower Santa Cruz. *See* Trans. 2 of 4 p. 16 (Burtell) (quoting the Center's Memorandum regarding the Navigability of the Santa Cruz River, filed on September 7, 2012 (Center's September 2012 Memorandum)).

85. The Commission finds, as a matter of fact, that Mr. Burtell's testimony concerning the Lower Santa Cruz was credible.

86. The Commission finds, as a matter of fact, that the evidence that Mr. Burtell relied upon was credible, as were Mr. Burtell's methods for evaluating the evidence and his conclusions and opinions based upon this evidence.

87. Based upon the evidence submitted and its review of the applicable law, the Commission hereby finds that the Lower Santa Cruz was neither used nor susceptible to being used for navigation in its ordinary and natural condition on or before February 14, 1912. Therefore, it is not and was not "navigable" as defined by the Arizona statute and the federal case law.

CONCLUSIONS OF LAW

I. THE PUBLIC TRUST AND EQUAL FOOTING DOCTRINES

1. Under the "public trust doctrine," the sovereign is generally considered to hold the beds of "navigable" watercourses in trust for the benefit of the public. *See Arizona Center for Law in the Public Interest v. Hassell*, 172 Ariz. 356, 359, 837 P.2d 158, 161 (App. 1991) ("*Hassell*").

1. This doctrine has origins in English common law, and when the original thirteen states gained their independence from England, they succeeded to this sovereign public trust interest for certain lands underlying navigable watercourses within their respective boundaries. *Hassell*, 172 Ariz. at 359, 837 P.2d at 161.

1. The United States Supreme Court has held, under the "equal footing doctrine," that as new states were admitted to the Union, they took title to the beds of navigable watercourses within their boundaries to the same extent as the original thirteen states. *Hassell*, 172 Ariz. at 359, 837 P.2d at 161 (citing *Pollard's Lessee v. Hagan*, 44 U.S. (3 How.) 212 (1845)).

II. PRIOR PROCEEDINGS ON NAVIGABILITY

2. In 1865, the Arizona Territorial Legislature declared the Colorado River to be "navigable." See Memorial of the Legislature of Arizona, 38th Cong., 2nd Sess., Mis. Doc. No. 17 (January 25, 1865). The Territorial Legislature, in its first session, expressly held that "the Colorado river is the only navigable water in this Territory . . . ." *Id.*

3. For the next 120 years, the public trust and equal footing doctrines were neither discussed nor asserted in Arizona. Then, in 1985, the State Attorney General's Office asserted an equal footing ownership claim to the bed of a watercourse other than the Colorado for the first time in litigation concerning a stretch of the Verde River. *Land Dep't v. O'Toole*, 154 Ariz. 43, 46, 739 P.2d 1360, 1363 (App. 1987).

4. Subsequently, various State officials alleged that the State might hold title to certain lands in or near other watercourses as well. *Id.* at 44, 739 P.2d at 1361. The State's assertion of these claims upset long-held assumptions concerning private ownership of lands in or near other watercourses and cast into doubt the title to more than 40,000 separate parcels of property. *Hassell*, 172 Ariz. at 359, 362, 837 P.2d at 161, 164. In Maricopa County alone, the property in question was estimated to be worth "hundreds of millions, if not billions of dollars . . . ." *O'Toole*, 154 Ariz. at 45, 739 P.2d at 1362.

5. In response to uncertainty caused by the State's assertion of "public trust" claims, the Legislature enacted House Bill 2017 in 1987. 1987 Ariz. Sess. Laws, ch. 127 ("1987 Act"). Under the 1987 Act, the State issued a blanket quitclaim of any public trust interest it might have to lands in the beds of all watercourses in the state other than the Colorado, Gila, Salt, and Verde Rivers. The 1987 Act also provided a process by which the record title holders of lands in the beds of the Gila, Salt, and Verde Rivers could obtain quitclaim deeds for these lands upon payment of a small fee. *See Hassell*, 172 Ariz. at 360, 837 P.2d at 162.

6. The Center commenced an action challenging the constitutionality of the 1987 Act. After the trial court entered summary judgment in favor of the defendants, the Arizona Court of Appeals held that the 1987 Act violated the public trust doctrine and the Gift Clause of the Arizona Constitution. *See Hassell*, 172 Ariz. at 361, 837 P.2d at 163; Ariz. Const. art. 9, § 7. The court held that the Gift Clause required a two-part test to determine whether the Legislature had acted properly in passing the 1987 Act. 172 Ariz. at 367, 837 P.2d at 169. The court stated that, to uphold the disclaimer of a potential claim by the State against a Gift Clause challenge, the reviewing court must determine: (1) that the disclaimer was designed to serve a "public purpose"; and (2) that the State has received "consideration" that is not "so inequitable and unreasonable that it amounts to an abuse of discretion, thus providing a subsidy to the private entity" that benefits from the

disclaimer. *Id.*

7. The *Hassell* court found that the 1987 Act satisfied the first part of the test, *i.e.*, that the enactment served a valid public purpose. Specifically, the court noted that the 1987 Act was "enacted in response to a valid legislative concern with the unsettling of record title to extensive landholdings throughout the state." *Id.* at 369, 837 P.2d at 171. The court found, however, that the 1987 Act failed the second part of the test because "the legislature acted without particularized information, and established no mechanism to provide particularized information, to support even an estimate of the value of those claims." *Id.* On this point, the court stated:

> We do not suggest that a full-blown judicial determination of historical navigability and present value must precede the relinquishment of any state claim to a particular parcel of riverbed land. An administrative process might reasonably permit the systematic investigation and evaluation of each of the state's claims. Under the present act [HB 2017], however, we cannot find that the gift clause requirement of equitable and reasonable consideration has been met.

Id. at 370, 837 P.2d at 172.

8. Following *Hassell*, the Legislature again addressed this issue. 1992 Ariz. Sess. Laws, ch. 297 ("1992 Act"). Among other things, the 1992 Act established this Commission, a five-member commission appointed by the Governor. *See* former A.R.S. § 37-1121. The charge given to the Commission by the 1992 Act was to conduct full evidentiary public hearings across the state and to adjudicate the State's claims to ownership of lands in the beds of watercourses. *See generally* former A.R.S. §§ 37-1122 to -1128.

9. The 1992 Act provided that the Commission would make findings of navigability or non-navigability for each watercourse. *See* former A.R.S. § 37-1128(A). Those findings were to be based upon the "federal test" of navigability in A.R.S. § 37-1101(6). The Commission would examine the "public trust values" associated with a particular watercourse only if and when it determined that the watercourse was navigable.

See former A.R.S. §§ 37-1123(A)(3), -1128(A).

10. The Commission began to take evidence on certain watercourses during the fall of 1993 and spring of 1994. In light of perceived difficulties with the 1992 Act, the Legislature revisited this issue during the 1994 session and amended the underlying legislation. See 1994 Ariz. Sess. Laws, ch. 278 ("1994 Act"). Among other things, the 1994 Act provided that the Commission would make a recommendation to the Legislature, which would then hold additional hearings and make a final determination of navigability by passing a statute with respect to each watercourse. *See id.* The 1994 Act also established certain presumptions of non-navigability and exclusions of some types of evidence. *See id.*

11. Based upon the 1994 Act, the Commission went forward with its job of compiling evidence and making a determination of whether each watercourse in the state was navigable as of February 14, 1912. The SLD issued technical reports on each watercourse, and numerous private parties and public agencies submitted additional evidence in favor of or opposed to navigability for particular watercourses. *See Defenders of Wildlife v. Hull*, 199 Ariz. 411, 416, 18 P.3d 722, 727 (App.), *reconsideration denied* (2001). The Commission reviewed the evidence and issued reports on each watercourse, which were transmitted to the Legislature. The Legislature then enacted legislation relating to the navigability of each specific watercourse. *See id.*

12. The Court of Appeals struck down that legislation in its *Hull* decision, finding that the Legislature had not applied the proper standards of navigability. 199 Ariz. at 427-28, 18 P.3d at 738-39.

13. In 2001, the Legislature again amended the underlying statute in another attempt to comply with the court's pronouncements in *Hassell* and *Hull*. *See* 2001 Ariz. Sess. Laws, ch. 166, § 1. The 2001 legislation now governs the Commission in making its findings with respect to the Santa Cruz.

14. The Arizona Court of Appeals issued its opinion in *State v. ANSAC* in 2010. *State v. Arizona Navigable Stream Adjudication Comm'n*, 224 Ariz. 230, 229 P.3d 242 (App. 2010).

15. The court stated: "we conclude that ANSAC was required to determine what the River would have looked like on February 14, 1912, in is ordinary (i.e., usual, absent major flooding or drought) and natural (i.e., without man-made dams, canals, or other diversions) condition." *State v. ANSAC.* at 241, 229 P.3d at 253.

16. Although the Court of Appeals determined that the Commission had taken into consideration the impact of Roosevelt Dam on the character of the Lower Salt, *State v. ANSAC*, at 240, 229 P.3d at 253, the court found insufficient evidence in the report to conclude that the Commission also had considered the impact of other man-made dams and diversions. *Id.*

17. Based upon the Court of Appeals' opinion in *State v. ANSAC*, all parties agreed that the issues relating to the six watercourses on which judicial appeals were then pending (Lower Salt, Upper Salt, Gila, Verde, San Pedro, and Santa Cruz) should be remanded to the Commission for further proceedings consistent with the appellate opinion.

18. The Commission's March 28, 2014 hearing on the Santa Cruz was the result of that remand.

III. THIS COMMISSION'S ROLE

19. Under the applicable statutes, the Commission has the exclusive jurisdiction to determine which, if any, Arizona watercourses were "navigable" on February 14, 1912 and, for any watercourses deemed navigable, to identify "public trust" values. *See* A.R.S. § 37-1123(G).

20. The statutes direct the Commission to make a finding of navigability or non-navigability for each watercourse "[b]ased only on evidence of navigability or non-

navigability." A.R.S. § 37-1123(A).

21. The Commission's statutory obligation for determining navigability, as amended in 2001, is relatively succinct:

> If the preponderance of the evidence establishes that the watercourse was navigable, the commission shall issue its determination confirming that the watercourse was navigable. If the preponderance of the evidence fails to establish that the watercourse was navigable, the commission shall issue its determination confirming that the watercourse in question was nonnavigable.

A.R.S. § 37-1128(A).

22. The statute defines "navigable" or "navigable watercourse" as:

> A watercourse that was in existence on February 14, 1912, and at that time was used or was susceptible to being used, in its ordinary and natural condition, as a highway for commerce, over which trade and travel were or could have been conducted in the customary mode of trade and travel on water.

A.R.S. § 37-1101(5).

23. "Highway for commerce" is defined as "a corridor or conduit within which the exchange of goods, commodities or property or the transportation of persons may be conducted." A.R.S. § 37-1101(3).

24. The Arizona statutory definition is a codification of the "federal test" of navigability first articulated by the United States Supreme Court in 1870 and applied by over one hundred courts in the last 130 years:

> Those rivers must be regarded as public navigable rivers in law which are in fact. And they are navigable in fact when they are used, or are susceptible of being used, in their ordinary condition, as highways for commerce, over which trade and travel are or may be conducted in the customary modes of trade and travel on water.

The Daniel Ball, 77 U.S. (10 Wall.) 557, 563, 19 L.Ed. 999 (1870).

IV. BURDEN OF PROOF

25. The statute establishes the burden of proof as the "preponderance of the evidence" and puts that burden on the proponents of navigability. See A.R.S. § 37-

1128(A). This allocation of the burden of proof is consistent with the pronouncements of the Arizona courts. *See Hassell*, 172 Ariz. at 363 n.10, 837 P.2d at 165 n.10; *O'Toole*, 154 Ariz. at 46 n.2, 739 P.2d at 1363 n.2; *Hull*, 199 Ariz. at 420, 18 P.2d at 731; *State v. ANSAC*, 244 Ariz. at 238-39, 229 P.3d at 250-51.

26. Thus, if sufficient evidence is not presented to show navigability for a particular watercourse, the Commission must find the watercourse non-navigable. The "preponderance of the evidence" standard is commonly used in Arizona civil litigation, as opposed to the higher burdens of proof imposed on the prosecution in criminal cases. The Revised Arizona Jury Instructions (Civil), for example, contain a suggested statement to jurors regarding how they should view this standard:

> Burden of proof means burden of persuasion. On any claim, a party who has the burden of proof must persuade you, by the evidence, that the claim is probably more true than not true. This means that the evidence that favors that party outweighs the opposing evidence. In determining whether a party has met this burden, consider all the evidence that bears on that claim, regardless of which party produced it.

RAJI (Civil) Standard 9 (1997).

27. The most commonly used legal dictionary contains the following definition of "preponderance of the evidence":

> Evidence which is of greater weight or more convincing than the evidence which is offered in opposition to it; that is, evidence which as a whole shows that the fact sought to be proven is more probable than not. *Braud v. Kinchen, La.* App., 310 So.2d 657, 659. With respect to burden of proof in civil actions, means greater weight of evidence, or evidence which is more credible and convincing to the mind. That which best accords with reason and probability. The word "preponderance" means something more than "weight"; it denotes a superiority of weight, or outweighing. The words are not synonymous, but substantially different. There is generally a "weight" of evidence on each side in case of contested facts. But juries cannot properly act upon the weight of evidence, in favor of the one having the onus, unless it overbear, in some degree, the weight upon the other side.

Black's Law Dictionary 1064 (5th ed. 1979).

28. The "preponderance of the evidence" standard is sometimes referred to as

requiring "fifty percent plus one" in favor of the party with the burden of proof. One could imagine a set of scales. If the evidence on each side weighs exactly evenly, the party without the burden of proof must prevail. In order for the party with the burden to prevail, sufficient evidence must exist in order to tip the scales (even slightly) in its favor. *See generally United States v. Fatico*, 458 F. Supp. 388, 403-06 (E.D.N.Y. 1978), *aff'd*, 603 F.2d 1053 (2d Cir. 1979), *cert. denied*, 444 U.S. 1073 (1980); *United States v. Schipani*, 289 F. Supp. 43, 56 (E.D.N.Y. 1968).

V. ORDINARY AND NATURAL CONDITION

29. The Arizona Court of Appeals in *State v. ANSAC*, 224 Ariz. at 230, 229 P.3d at 242, addressed what constitutes the "ordinary and natural condition" of a river for purposes of the Arizona statute and the federal test of navigability.

30. In addressing what constituted the "ordinary and natural condition" of the Lower Salt, the Court of Appeals first started with the time "before the Hohokam people arrived many centuries ago and developed canals and other diversions that actively diverted the River." *State v. ANSAC,* 224 Ariz. at 242, 229 P.3d at 254. Recognizing that "little if any historical data exists from that period" and that the Lower Salt "largely returned to its natural state" after the Hohokam disappeared, the court found that "the River could be considered to be in its natural condition after many of the Hohokam's diversions had ceased to affect the River, but before the commencement of modern-era settlement and farming in the Salt River Valley. . . ." *Id.*

31. Although the Court of Appeals determined that "evidence from that early period should be considered by ANSAC as the best evidence of the River's natural condition," 224 Ariz. at 242, 229 P.3d at 254, the court also recognized that evidence from later (or earlier) periods could have probative value. Id. at 243, 229 P.3d at 255. Thus, this Commission has authority to consider such evidence and to give it the appropriate weight. *Id.*

32. The *State v. ANSAC* court rejected arguments by the proponents of navigability that any evidence dated after the commencement of man-made diversions should be thrown out and disregarded. "Even if evidence of the River's condition after man-made diversions is not dispositive, it may nonetheless be informative and relevant." *State v. ANSAC*, 224 Ariz. at 243, 229 P.3d at 255.

33. The Commission finds, as a matter of fact, that the evidence summarized in Sections II through V to the foregoing Findings of Fact is the best evidence of the Santa Cruz River's ordinary and natural condition.

VI. SEGMENTATION

34. As discussed above, the Arizona courts have held the proponents of navigability bear the burden of proving that a river is navigable.

35. The United States Supreme Court in *PPL Montana* found that proof of navigability must be made on a "segment-by-segment" basis: "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." 132 S. Ct. at 1229. Thus, the proponents of navigability must demonstrate, by a preponderance of the evidence, that specific segments of a watercourse are navigable.

36. The *PPL Montana* ruling on segmentation is consistent with the process set up in the Arizona statutes and with what this Commission has done in the past. The relevant statute defines "watercourse" as "the main body or a portion or reach of any lake, river, creek, stream, wash, arroyo, channel or other body of water. . . ." *See* A.R.S. § 37-1101(11).

37. The Arizona statute authorizes this Commission to address watercourses in segments (or "portions" or "reaches," as used in the Arizona statute) rather than in their entirety. *See* A.R.S. § 37-1101(11).

38. The proponents of navigability have not shown that any segment of the Santa Cruz River is navigable. *See generally* Findings of Fact, *supra*.

VII. ACTUAL NAVIGATION ON THE SANTA CRUZ

39. The Commission finds, as a matter of law and fact, that there is no evidence that the Santa Cruz was ever used as a "highway for commerce." *See* Findings of Fact, *supra*. None of the historical research revealed historical use of the river for boating or for commerce. *See* Findings of Fact, *supra*. There also was no evidence that logs had been floated down the river. *See* Findings of Fact, *supra*.

40. The Commission received no credible evidence showing that the Santa Cruz was ever used as a "highway for commerce," over which trade and travel were conducted in the customary mode of trade and travel on the water. *See* A.R.S. § 37-1101(5). The Commission thus finds, as a matter of law and fact, that the Santa Cruz was never used for actual navigation, as defined in Section 37-1101(5).

VIII. SUSCEPTIBILITY TO NAVIGATION

41. Because the Commission has found, as matter of law and fact, that the Santa Cruz was not actually used as a "highway for commerce," the Commission can find the Santa Cruz navigable only if the proponents of navigability have shown by a preponderance of the evidence that the river was "susceptible" to such use.

42. The evidence in the record does not satisfy that standard. Evidence from the Santa Cruz's long history demonstrates it was not "a corridor or conduit within which the exchange of goods, commodities, or property or the transportation of persons may be conducted." *See generally* Findings of Fact, *supra; see also* A.R.S. § 37-1103(3) (definition of "highway for commerce").

43. While the absence of commercial navigation is not dispositive "where conditions of exploration and settlement explain the infrequency or limited nature of such use," *United States v. Utah*, 283 U.S. 64, 82, 51 S. Ct. 438, 443 (1931), the evidence

presented to the Commission demonstrates that the Santa Cruz would have been used to transport personnel and supplies if the Santa Cruz were susceptible to navigation. *See* Findings of Fact, *supra.*

44. The stream's physical characteristics also support a finding that the Santa Cruz was not susceptible to navigation in its natural and ordinary condition at or before statehood. Historical descriptions and stream flow data (adjusted for diversions) lead to the conclusion that the Santa Cruz was not susceptible to navigation. *See* Findings of Fact, *supra.*

45. The absence of any records of explorers, missionaries, or travelers boating on the Santa Cruz supports the finding that the river simply was not navigable.

46. The Santa Cruz's flow was not, in its ordinary and natural condition or otherwise, continuous or reliable throughout the year. Therefore, it was not "susceptible" to navigation. *See* Findings of Fact, *supra.* Given the weight of the data and evidence, the Commission finds, as a matter of law and fact, that the Santa Cruz was not "susceptible" to being used as a "highway for commerce" in its ordinary and natural condition on February 14, 1912.

IX. DETERMINATION OF NON-NAVIGABILITY

47. "[A] river is navigable in law when it is navigable in fact." *Muckleshoot Indian Tribe v. FERC*, 993 F.2d 1428, 1431 (9th Cir. 1993).

48. "[I]t is not . . . every small creek in which a fishing skiff or gunning canoe can be made to float at high water which is deemed navigable." *Hassell*, 172 Ariz. at 363, 837 P.2d at 165 (quoting *The Montello,* 87 U.S. (20 Wall.) 430, 22 L. Ed. 391 (1874)). "[T]he vital and essential point is whether the natural navigation of the river is such that it affords a channel for useful commerce." *Id.*

49. Evidence of navigability "must be confined to that which shows the river could sustain the kinds of commercial use that, as a realistic matter, might have occurred

at the time of statehood." *PPL Montana*, 132 S.Ct. at 1233.

50. "Navigability must be assessed as of the time of statehood, and it concerns the river's usefulness for 'trade and travel,' rather than for other purposes." *PPL Montana*, 132 S.Ct. at 1233. For these reasons, "[m]ere use by initial explorers or trappers, who may have dragged their boats in or alongside the river despite its nonnavigability in order to avoid getting lost, or to provide water for their horses and themselves, is not itself enough." *Id.* Finally, the Court stated that a finding of navigability must be founded on the kind of trade and travel on water that constitutes "a commercial reality." *Id.* at 1234.

51. "[S]egments that are nonnavigable at the time of statehood are those over which commerce could not then occur." *PPL Montana,* 132 S. Ct. at 1230.

52. Occasional use of rivers that flow only during exceptional times does not support a finding of navigability. *See Oklahoma v. Texas*, 258 U.S. 574 (1922), *reconsideration denied,* 260 U.S. 711 (1923); *Brewer-Elliott*, 260 U.S. at 77; *Crow, Pope & Land,* 340 F. Supp. at 32. In *Oklahoma v. Texas*, the Court decided the navigability of Red River, upon which boats were able to move on the river only during times where flow on the river was "intermittent, of irregular and short duration, and *confined to a few months in the year.*" 258 U.S. at 589 (emphasis added). In concluding that Red River was not navigable, the Court stated: "Its characteristics are such that its use for transportation has been and must be exceptional, and confined to the irregular and short period of temporary high water. *A greater capacity for practical and beneficial use in commerce is essential to establish navigability.*" *Id.* at 591 (emphasis added). Although a river need not be susceptible to navigation at every point of the year, "neither can that susceptibility be so brief that is it not a commercial reality." *PPL Montana*, 132 S. Ct. at 1234.

53. The Commission also finds that there is no evidence of any historical or

modern commercial boating having occurred on the Santa Cruz River.

54. The Commission also finds that there is no evidence of any commercial fishing having occurred on the Santa Cruz River.

55. The Commission finds that that the Santa Cruz (with respect to each of its Upper, Middle, and Lower segments) was too shallow to be susceptible to being used for navigation in its ordinary and natural condition on February 14, 1912.

56. This finding is independent of the Commission's determination, below, that the Santa Cruz was neither used nor susceptible to being used for navigation in its ordinary and natural condition on February 14, 1912 for the additional reason that it included repeated gaps in flow that precluded the stream from being susceptible to being used for navigation in its ordinary and natural condition on February 14, 1912.

57. The Commission finds that that the Santa Cruz (with respect to each of its Upper, Middle, and Lower segments) included repeated gaps in flow in its ordinary and natural condition, including multiple gaps in regular flow that would require portages of many miles, and that these gaps in flow precluded the stream from being susceptible to being used for navigation in its ordinary and natural condition on February 14, 1912.

58. This finding is independent of the Commission's determination, above, that the Santa Cruz was neither used nor susceptible to being used for navigation in its ordinary and natural condition on February 14, 1912 for the additional reason that it was too shallow to be susceptible to being used for navigation in its ordinary and natural condition on February 14, 1912.

59. The Commission further finds that all notices of these hearings and proceedings were properly and timely given.

60. Based upon the evidence submitted and its review of the applicable law, the Commission hereby finds that the Santa Cruz (with respect to each of its Upper, Middle, and Lower segments) was neither used nor susceptible to being used for navigation in its

ordinary and natural condition on February 14, 1912. Thus, it is not and was not "navigable" as defined by the Arizona statute and the state and federal case law.

RESPECTFULLY SUBMITTED this 3rd day of July, 2014.

SNELL & WILMER L.L.P.

L. William Staudenmaier
Attorneys for Freeport Minerals Corporation

FENNEMORE CRAIG, P.C.

By _____
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MAILING CERTIFICATE

ORIGINAL AND SIX COPIES of the foregoing
Sent via U.S. mail for filing this 3rd day of July, 2014 to:

Arizona Navigable Stream Adjudication Commission
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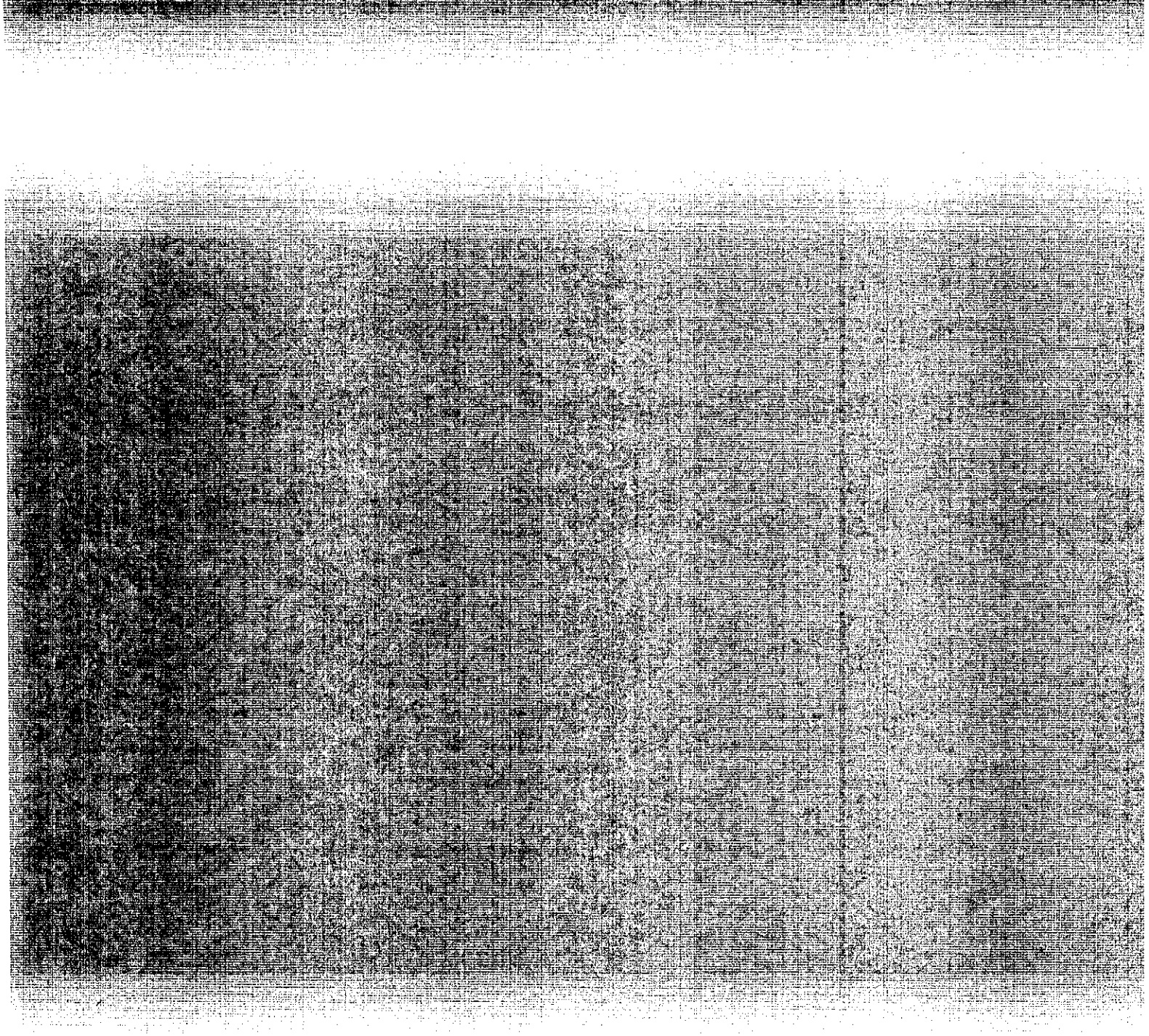
COPY sent via e-mail this 3rd day of July, 2014 to each
party on the mailing list (see http://www.ansac.az.gov/parties.asp)
for *In re Determination of Navigability of the Santa Cruz River*

By: Kathy Power



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BEFORE THE ARIZONA NAVIGABLE STREAM ADJUDICATION COMMISSION

IN THE MATTER OF THE NAVIGABILITY OF THE SANTA CRUZ RIVER FROM THE MEXICAN BORDER TO THE CONFLUENCE WITH THE GILA RIVER; SANTA CRUZ, PIMA AND PINAL COUNTIES, ARIZONA	No. 03-002-NAV (Santa Cruz) **GILA RIVER INDIAN COMMUNITY'S PROPOSED FINDINGS OF FACT AND CONCLUSIONS OF LAW**

Pursuant to the direction of the Arizona Navigable Stream Adjudication Commission ("ANSAC" or "Commission"), the Gila River Indian Community submits its proposed findings of fact and conclusions of law. The Community also joins in the San Carlos Apache Tribe's Findings of Fact and Conclusions of Law, dated April 15, 2014.

FINDINGS OF FACT

1. On October 18, 2006, the Commission issued its Report, Findings and Determination Regarding the Navigability of the Santa Cruz River from the Mexican Border to the Confluence with the Gila River; Santa Cruz, Pima and

Pinal Counties, Arizona ("ANSAC Report").

2. All findings of fact made in the Report are incorporated herein.

3. Freeport Minerals Corporation submitted, in October 2013, the "Declaration of Rich Burtell on the Non-Navigability of the Santa Cruz River At and Prior to Statehood" ("Burtell Declaration"). [X004]

4. The Arizona Center for Law in the Public Interest submitted, on March 24, 2014, a report entitled "Navigability Along the Natural Channel of the Santa Cruz River," by Hjalmar W. Hjlamarson, P.E. ("Hjalmarson Report"). [X005]

5. The Gila River Indian Community submitted, on April 15, 2014, a report entitled "Navigability of the Santa Cruz River," by T.A.J. Gookin, P.E., R.L.S., P.H., S.W.R.S. ("Gookin Report").[1] [X007]

6. The Santa Cruz River has its headwaters at the southern base of the Canalo Hills in Santa Cruz County, Arizona, and flows generally south as a shallow perennial stream through the San Rafael valley before crossing into Mexico near the town of Loquiel. [ANSAC Report 3]

7. The river describes a loop of about 30 miles with a 348-square

[1] The Gookin Report was submitted on April 15, 2014, after the hearing in Tucson. This was necessitated by the fact that the Hjalmarson Report, to which it responds, was received by the Community *three days* before the Tucson hearing (the report was received on March 25, 2014 and the hearing held on March 28, 2014, although Mr. Hjalmarson did not testify at the hearing).

mile contributing drainage area in Mexico before reentering the United States approximately six miles east of Nogales. [ANSAC Report 3]

8. The river channel continues northward from the international boundary with Mexico past Rio Rico, Tumacacori National Monument, Tubac, Green Valley, San Xavier del Bac, and Tucson, and then in a northwesterly direction past the town of Marana, south of Eloy and Casa Grande near the Indian village of Chui Chui in Pima County, and then flows into Pinal County past the settlement of Maricopa where it flows into the Gila River a few miles south of the confluence of the Gila and Salt River. [ANSAC Report 4]

9 The reach of the Santa Cruz River previously considered by ANSAC is a total distance of 225 miles. [ANSAC Report 4]

10. The major tributaries of the Santa Cruz River from south to north are Nogales Wash, Sonoita Creek, Rillito Creek, Canada del Oro Wash and the Altar-Brawley Wash. [ANSAC Report at 4]

11. The upper Santa Cruz River is an intermittent stream meaning that most of the river flows for only part of the year or only during wet weather, while some short reaches of its course flow year-round. [Wood, House & Pearthree (1999) 14]

12. The lower Santa Cruz River has ephemeral flow that results directly from precipitation. [Wood, House & Pearthree (1999) 14]

13. In the historical record, only the very largest flows were sustained from the headwaters of the Santa Cruz River to its confluence with the Gila River. [Wood, House & Pearthree (1999) 14]

14. The underflow, or subflow, of the Santa Cruz River maintained several cienegas (marshes) near Sentinel Peak in Tucson, where geologic conditions forced the groundwater to surface. [Wood, House & Pearthree (1999) 14]

15. Cienegas also existed about 10 miles south of Tucson above the San Xavier Mission and along both the West Branch and the Santa Cruz River proper about three miles south of the Congress Street Crossing in Tucson. [Wood, House & Pearthree (1999) 14]

16. Two reaches of the Santa Cruz River currently have flow resulting from the discharge of treated municipal effluent from treatment plants at Ina Road and Roger Road beginning in 1970 and south of Nogales beginning in 1972. [Wood, House & Pearthree (1999) 14]

17. The streambed of the Santa Cruz River is generally quite permeable and water is lost to the subsurface as the flood flows move downstream. [Wood, House & Pearthree (1999) 16]

18. There is no record of the Santa Cruz River ever supporting a perennial flow. [ANSAC Report at 25]

19. During the prehistoric period, the Santa Cruz River appears to have been intermittent and did flow periodically above ground, especially when fed by springs in the Canoa, San Xavier and Tucson areas. [ANSAC Report 20]

20. The early indigenous inhabitants used the Santa Cruz River valley as a transportation corridor, but there is no evidence whatsoever of any use of the river for travel or navigation. [ANSAC Report 20]

21. In prehistoric times, the Santa Cruz River was a source of water for people traveling through the area and sometimes in flood season could be used for irrigation. [ANSAC Report 20]

22. The Santa Cruz River was used for continuous irrigation for a least a thousand years in the middle Santa Cruz valley. [Mabry & Thiel (1995) 1]

23. "Flood farming" was practiced along the Santa Cruz River by at least 800 B.C. [Mabry & Thiel (1995) 1]

24. Following 2,000 years of flood farming, the first canals were built in the Santa Cruz floodplain and most canals were constructed between 950 and 1100 A.D. [Mabry & Thiel (1999) 1]

25. Most of the known prehistoric canals in the middle Santa Cruz valley were abandoned between 1100 and 1450 A.D. following downcutting of some segments of the river channel. [Mabry & Thiel (1999) 2]

26. The Santa Cruz River had underground flow in prehistoric times

and marshes were created by volcanic hills which forced the underground flow to the surface. [Mabry & Thiel (1999) 3]

27. It is well-documented that irrigation has been practiced along the middle reach of the Santa Cruz River for centuries, if not millennia. [Burtell Declaration 5]

28. The Santa Cruz River was described as dry from Canoa to San Xavier del Bac in 1775. [Burtell Declaration, Table 2]

29. In 1804, the Santa Cruz River was described as enjoying a steady flow only in the rainy seasons. [Burtell Declaration, Table 2]

30. In 1804, when the rainfall was only average or below, the Santa Cruz River flowed above ground to a point five miles north of Tubac and went underground all the way to San Xavier del Bac. [Burtell Declaration, Table 2]

31. In 1849, the Santa Cruz River was described as sinking into the sand just below a ranch at Tumacacori and appearing again only at intervals for many miles. [Burtell Declaration, Table 2]

32. In 1852, the Santa Cruz River was observed to be "quite dry" despite that rain had recently fallen. [Burtell Declaration, Table 2]

33. Numerous historical accounts during the 19th century noted that the middle Santa Cruz River had a discontinuous flow. [Burtell Declaration, Table 2]

34. Historical accounts of the Santa Cruz River in the 18th and 19th centuries often described the middle Santa Cruz River as dry or with an intermittent flow. [Burtell Declaration, Table 2]

35. The discontinuous flows of the middle reach of the Santa Cruz River would have required long portages. [Burtell Declaration 5]

36. Where flow was regular on the middle Santa Cruz River, historic accounts indicate it was too shallow for commercial boat travel. [Burtell Declaration 5]

37. In areas where the middle Santa Cruz River had regular flow, the flow was shallow (one foot or less) and in places narrow. [Burtell Declaration 5]

38. Even if flows had been regular, because of the underground flow of the middle reach of the Santa Cruz River, portages of up to 24 miles would have been required. [Burtell Declaration 6]

39. There was also a lack of regular flow along the lower reach of the Santa Cruz River documented in the 17th and 18th centuries. [Burtell Declaration 11]

40. In 1697, it was documented that the flow of the Santa Cruz River disappeared near Picacho Peak and reappeared near the confluence with the Gila River. [Burtell Delcaration 11]

41. Historical pre-development accounts of the Santa Cruz River indicate that there were not sufficient flows in the river to support commercial trade or travel by boat.

42. In the upper valley of Santa Cruz County, the Santa Cruz River was described as a low-flowing, perennial stream with some marshy areas and cienegas. [ANSAC Report 23]

43. Near the Pima County line, the Santa Cruz River went subsurface and was dry most of the year but surfaced near San Xavier del Bac. [ANSAC Report 24]

44. In the lower Santa Cruz River, from Marana northwest, the river flowed only intermittently and as a result of precipitation. [ANSAC Report 24]

45. Although there are reports of attempts at floating down the Santa Cruz River, there are no reports of any successful navigation over any significant portion or reach of the river. [ANSAC Report 24]

46. Recreational boating did take place on two artificial lakes on the Santa Cruz River which were built in the 1860's to 1880's south of Tucson. [ANSAC Report 24]

47. The Santa Cruz River valley has served as an overland trade or travel route from prehistoric times, but there is no documented record of any trade or travel on the river during the period leading up to statehood. [ANSAC

Report 25]

48. Travel near the Santa Cruz River was accomplished by horseback, wagon, pack mule, trains and, later, automobiles. [ANSAC Report 25]

49. There is no evidence that the Hohokam ever used the Santa Cruz River for travel by water. [Gookin Report II-1]

50. Despite archaeological records of Hohokam activities, none of those records contain any reference to boating or travel by water. [Gookin II-2]

51. Despite well documented use of the Santa Cruz River valley as a transportation and settlement corridor since prehistoric times, no archaeological evidence of navigation along the Santa Cruz River has ever been found. [Gookin II-3, quoting Fuller]

52. Hjalmarson performed an assessment of the Santa Cruz River using hydraulic geometry methods to compute possible river flows in pre-development conditions.

53. Once he arrived at his calculated flow depths, Hjalmarson used criteria for navigability developed by Hyra (1978) and Cortell (1977) as standards for whether the computed depths were sufficient for navigation.

54. Hyra's methodology is specifically for determining streamflows required for modern recreation and aesthetics. [Hyra (1978) 1]

55. Hyra also states that in additional to flow data, data relating the

streamflow parameters for recreation potential are necessary. [Hyra (1978) 2]

56. Hyra provides that his methodology is best applied to those streams in which the flows are expected to be higher than the minimum most of the time. [Hyra (1978) 3]

57. For recreational canoeing or kayaking, Hyra specifies a "safe" *minimum* of 1.0 feet and an optimum *minimum* of greater than 2.5 feet. [Hyra (1978) A-12]

58. Cortell's methodology is specifically for determining streamflow requirements for modern recreation. [Cortell (1977)]

59. Cortell identifies an optimum condition for canoeing as a depth of 2 to 3 feet. [Cortell (Vol. 1, 1977) 12]

60. As with Hyra, Cortell's methodology also requires examination of the stream in question to determine whether recreational activities may be supported at various stream flows and in specific areas. [Cortell (Vol. 1, 1977) 10]

61. The methodologies developed by Hyra and Cortell were specific to modern recreational use and do not address streamflow requirements for commercial navigation.

62. Hjalmarson concluded that the natural channel of the Sanra Cruz River, including the portion that has always flowed underground, from the

Mexican border to the Picacho-Redrock area was susceptible to navigation 75 percent of the time in its ordinary and natural condition.

63. In order to determine whether a river is navigable, there are many factors to consider but two factors tend to overshadow others—the amount of water in the river channel and the shape and size of the river channel. [Gookin IV-1]

64. The Bureau of Reclamation "White Book" provides mean annual flow data for the Santa Cruz River at Rillito (also known as Cortaro) and Nogales. [Gookin IV-3]

65. The proportioning of average flows should only be done using the White Book at points where the Santa Cruz River was perennial or nearly so in the 1914 to 1945, so as to exclude areas of depleted flow such as where the river could have been flowing underground through the sand. [Gookin IV-4]

66. It is unclear where the data for Hjalmarson's plotting of the Nogales curve came from. [Gookin IV-6]

67. Hjalmarson assumes that the Nogales curve is typical for all locations on the Santa Cruz River. [Gookin IV-6]

68. Using the Nogales curve for other downstream locations on the Santa Cruz River is unworkable because of the dry reaches which cause the entire river to periodically go underground and re-emerge in a different pattern.

[Gookin IV-8]

69. Numerous studies have shown that, downstream from Nogales, large amounts of the flow of the Santa Cruz River quickly disappeared into the sand. [Gookin IV-8]

70. Ordinary flows of the Santa Cruz River would disappear into the sand regardless of whether there were upstream diversions. [Gookin IV-9]

71. The curves created by Hjalmarson were artificially adjusted to account for the historical accounts of the Santa Cruz River being dry at various times. [Gookin IV-9]

72. Making the artificial reductions in his curves at 80 or 90 percent permits Hjalmarson to claim that 75% of the time the river was navigable when the base runoff for the three gages show flow was at or near zero at least 50% of the time. [Gookin IV-10]

73. The equations Hjalmarson used for determining the width of the river were not intended to provide widths for an entire river. [Gookin V-1]

74. Empirical research requires consideration of rates of error in calculations or methodology. [Gookin V-2]

75. Standards for navigability should be based upon determinations of error in the measurements used to determine the depths required. [Gookin V-4-6]

76. A substantial error must be added to the width computed to reasonably demonstrate that a river is navigable. [Gookin V-7]

77. Hjalmarson's methodology did not account for or compute error, either as to his calculations or with regard to the methodology used; rather, he relied on absolute minimums for navigability determinations without any field checks.

78. Hjalmarson should have made adjustments to his model to account for different conditions of the Santa Cruz River for river types as perennial, braided and intermittent, but failed to do so. [Gookin V-8]

79. Navigation of a braided river takes more flow than other river types. [Gookin V-8]

80. On a braided river, the water normally flows in one of the low flow channels, but when flow increases, the river overflows the shallow depression and moves into a secondary low flow channel. [Gookin V-9]

81. With increasing flows in a braided river, the river spreads out from side to side. [Gookin V-9]

82. At statehood, portions of the middle Santa Cruz River were a compound or braided channel. [Gookin V-9]

83. Hydraulic geometry methodology is less accurate when used on braided channels. [Gookin V-10]

84. Rivers can take decades to recover from braiding which occurs after major flooding events. [Gookin V-10-11]

85. Hjalmarson also incorrectly assumed in his calculations that the Santa Cruz River had one parabolic channel shape; however, rivers such as the Santa Cruz River are variable. [Gookin VI-2-7]

86. Three feet of depth was necessary for commercial navigation in the southwest United States in 1896 and depths required for navigation have generally increased over time. [Gookin VII-12]

87. The Santa Cruz River has never had median or mean depths of three feet or deeper in any significant reach, either in pre-development times or at the time of statehood.

88. Additional obstacles, not accounted for in Hjalmarson's study, such as cienegas, riffles and braiding, also would have prevented navigation on the Santa Cruz River. [Gookin VII-12]

CONCLUSIONS OF LAW

1. A watercourse is "navigable" if it "was in existence on February 14, 1912, and at that time was used or susceptible to being used, in its ordinary and natural condition, as a highway for commerce over which trade and travel were or could have been conducted in the customary modes of trade and travel on water." A.R.S. § 37-1101(5).

2. The Commission is charged with receiving, reviewing and considering all relevant historical or other evidence regarding the navigability of non-navigability of Arizona's watercourses as of February 14, 1912. A.R.S. § 37-1123(A).

3. Based upon evidence of navigability or non-navigability, the Commission must determine which watercourses were navigable or non-navigable as of February 14, 1912. A.R.S. §§ 37-1123(A)(1)(2).

4. The Commission's inquiry must include collecting and documenting "all reasonably available evidence regarding the condition and usage of a watercourse as of February 14, 1912." A.R.S. § 37-1124(B).

5. "After the commission completes the public hearing with respect to a watercourse, the commission shall again review all available evidence and render its determination as to whether the particular watercourse was navigable as of February 14, 1912. If the preponderance of the evidence establishes that the watercourse was navigable, the commission shall issue its determination confirming that the watercourse was navigable. If the preponderance of the evidence fails to establish that the watercourse was navigable, the commission shall issue its determination confirming that the watercourse was nonnavigable." A.R.S. § 37-1128(A).

6. The burden of proof of navigability rests on the party asserting

navigability, *State ex rel. Winkleman v. Ariz. Navigable Stream Adjudication Comm'n*, 229 P.3d 242, 251 (Ariz.App. 2010) (citations omitted) ("State v. ANSAC"), and to meet this burden the proponents of navigability must prove navigability by a preponderance of the evidence. *Id.*

7. When a party has the burden of proof on any claim by a preponderance of the evidence, it means that the fact finder must be persuaded by evidence that the claim is more probably true than not. Ninth Circuit Model Jury Instructions, 1.3 Burden of Proof—Preponderance of the Evidence.

8. Although ANSAC's process is outlined in the *Arizona Revised Statutes*, the determination of questions of navigability for determining state title is governed by federal law. *PPL Montana, LLC v. Montana*, 132 S.Ct. 1215, 1227 (2012); *United States v. Utah*, 283 U.S. 64, 75 (1931).

9. The standard for navigability expressed in the *Arizona Revised Statutes* is a codification of the federal test of navigability first expressed by the Supreme Court of the United States in *The Daniel Ball*, 77 U.S. (10 Wall.) 557, 563 (1870), "Those rivers must be regarded as public navigable rivers in law which are navigable in fact when they are used, or are susceptible of being used, in their ordinary condition, as highways for commerce, over which trade and travel are or may be conducted in the customary modes of trade and travel on water."

10. The significance of navigability is that, under the equal-footing doctrine, "the people of each State . . . hold the absolute right to all their navigable waters and the soils under them. *PPL Montana*, 132 S.Ct. at 1227 (citation omitted).

11. For state title under the equal-footing doctrine, navigability is determined at the time of statehood . . . and based on the natural and ordinary condition of the water." *Id.* at 1228 (citations omitted).

12. In *State v. ANSAC*, the Court of Appeals of Arizona addressed the issue of what constitutes the "ordinary and natural condition" of a river for purposes of determining navigability.

13. *State v. ANSAC* is erroneous for a number of reasons and must be interpreted in light of *PPL Montana*, which is a binding federal precedent.

14. The statement that the Commission may not begin with any presumption *against* navigability, *State v. ANSAC*, 229 P.3d at 251, contradicts the legal concept of the burden of proof, which has the practical effect of creating a presumption in favor of the party without the burden. The court's citation to A.R.S. § 37-1121(B) on this issue was completely misplaced because lack of bias is not the same as a legal presumption which operates against the party with the burden of proof. Thus, in the absence of a *prima facie* case of navigability, the Commission would necessarily have to find the Santa Cruz

River is non-navigable.

15. *State v. ANSAC* also held that the Commission misapplied the "ordinary and natural condition standard" because it was unclear whether the Commission considered the meaning of both "ordinary" and "natural" and surmised that the Commission "effectively conflated these terms." *Id.* at 253-4.

16. Instead of considering federal law on this federal issue, the court applied Arizona law to the definition which appears at A.R.S. § 37-1101(5), to determine the Arizona legislature's intent. *Id.* at 252 (citations omitted).

17. In applying Arizona law to this federal standard, the court concluded that "ANSAC was required to determine what the River would have looked like on February 14, 1912, in its ordinary (i.e., usual, absent major flooding or drought) and natural (i.e., without man-made dams, canals or other diversions) condition." *Id.* at 253 (citations omitted).

18. In its analysis, however, *State v. ANSAC* failed to consider law which clearly provides that it is to look at the physical condition of a river as of the date of statehood.

19. This includes A.R.S. § 37-1124(B), which charges the Commission with collecting and documenting all reasonably available evidence "regarding the condition and usage of a watercourse as of February 14, 1912."

20. In discussing the relevance of evidence of modern day recreational

use of a stream in *PPL Montana*, the Supreme Court held that a proponent of navigability must show that "the river's poststatehood condition is not materially different from its physical condition at statehood." *PPL Montana*, 132 S.Ct. at 1233 (citation omitted).

21. The standard established in *State v. ANSAC* is vague and unworkable because a river's ordinary and natural condition, as defined by the court, could be based upon time periods encompassing or separated by hundreds or thousands of years with conflicting results.

22. The Commission should presume that the river's physical condition, as of the date of statehood, is the natural and ordinary condition of the river for purposes of determining navigability.

23. In its physical condition as of the date of Arizona's statehood, February 14, 1912, the Santa Cruz River was neither used nor susceptible to being used, in its ordinary and natural condition, as a highway for commerce over which trade and travel were or could have been conducted in the customary modes of trade and travel on water.

24. In *PPL Montana*, the Supreme Court also rejected use of modern day recreation as a basis for determining navigability as of the date of statehood, holding that the Montana Supreme Court erred in relying upon evidence of present-day, primarily recreational use. *PPL Montana*, 132 S.Ct. at

1233.

25. Instead, the court said that "evidence must be confined to that which shows the river could sustain the kinds of commercial use that, as a realistic matter, might have occurred at the time of statehood." *Id.* "Mere use" by explorers or trappers is not enough. *Id.*

26. As with the issue involving the physical condition of the river at the time of statehood, the Supreme Court was clear that use or susceptibility of use as a highway of commerce is to be determined "at the time of statehood." *Id.*

27. "Evidence of present-day use may be considered to the extent it informs the historical determination whether the river segment was susceptible of use for commercial navigation at the time of statehood." *Id.*

28. In undertaking this analysis, "it must be determined whether trade and travel could have been conducted in the customary modes of trade and travel on water over the relevant river segment in its natural and ordinary condition." *Id.* (citation omitted).

30. The Santa Cruz River was not used for commercial trade or travel prior to Arizona's statehood, February 14, 1912.

31. The San Cruz River was not susceptible to use for navigation in its ordinary and natural condition, as defined in *State v. ANSAC*, as of the date of

Arizona's statehood, February 14, 1912.

32. The methodology proffered by proponents of navigability for determining whether the Santa Cruz River was susceptible to navigation in its natural and ordinary condition were two studies for determining suitability for modern-day recreation—*Methods of Assessing Instream Flows for Recreation* (Hyra, 1978) and *Recreation and Instream Flow, Vol. 1, Flow Requirements, Analysis of Benefits, Legal and Institutional Constraints* (Jason M. Cortell & Assoc., Inc., 1977).

33. The proponents' method and analysis fails to meet the requirements of *PPL Montana* because the proffered methods and criteria for navigability are exclusively for determining present-day recreational use with modern watercraft and there was no testimony or evidence that the results of applying those methods would apply to the customary modes of trade and travel on water as of the date of statehood.

34. The proponents of navigability have failed to meet their burden of proof.

35. The Commission applied the correct legal standard in its prior proceedings and report.

36. The Commission reaffirms the findings and conclusions it made in its Report, Findings and Determination Regarding the Navigability of the Santa

Cruz River from the Mexican Border to the Confluence with the Gila River dated October 18, 2006.

37. Should *State v. ANSAC* require the application of a different legal standard, in light of *PPL Montana*, the Commission concludes that the Santa Cruz River was not used or susceptible to being used, in its ordinary and natural condition, as a highway for commerce over which trade and travel were or could have been conducted in the customary modes of trade and travel on water.

38. Because the Santa Cruz River is nonnavigable in its entirety, there is no reason for the Commission to perform a segmentation analysis under *PPL Montana*.

DATED this 3rd day of July 2014.

GILA RIVER INDIAN COMMUNITY

By _____
Thomas L. Murphy

FILED on the 3rd day of July, 2014 with:

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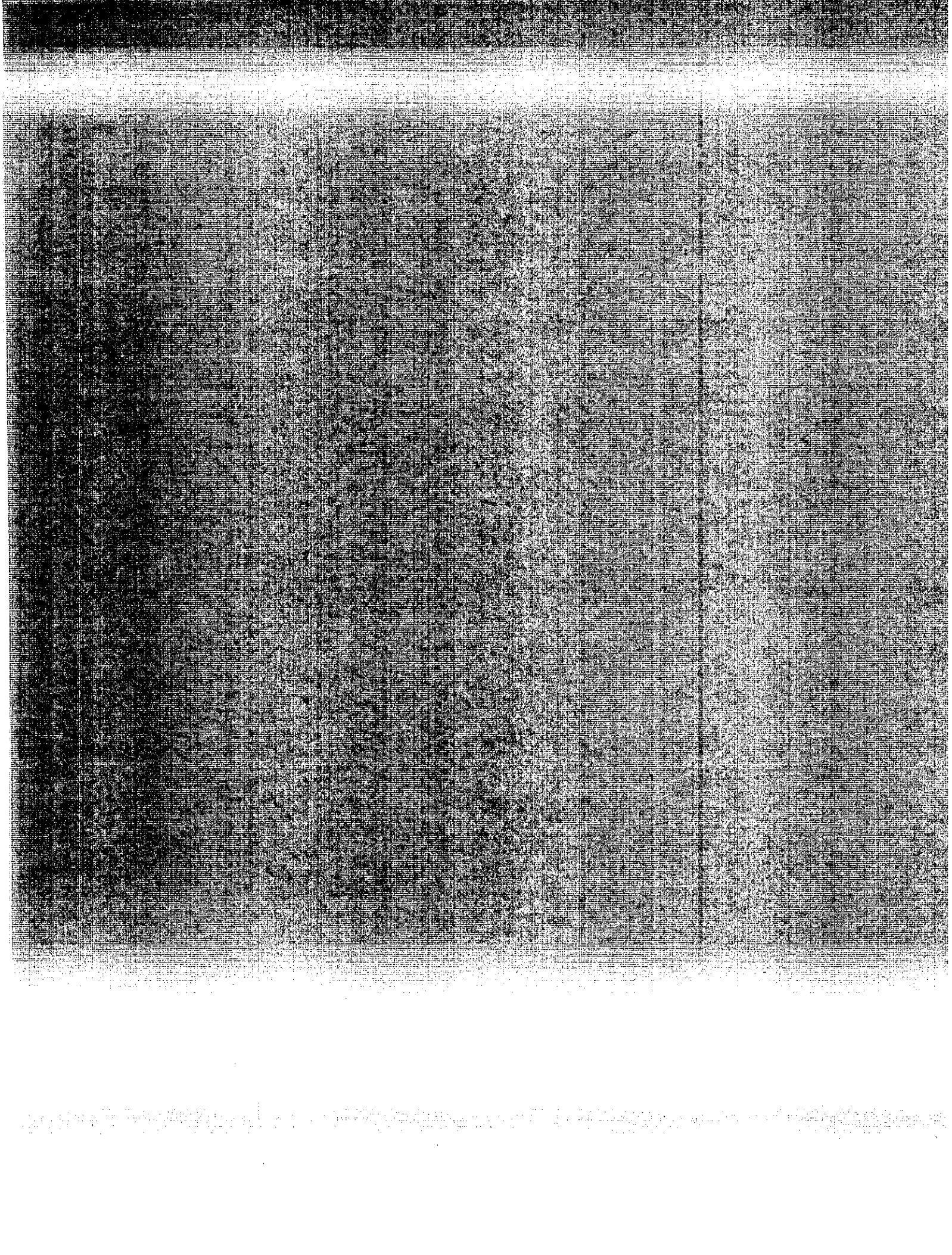

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BEFORE THE ARIZONA NAVIGABLE STREAM ADJUDICATION COMMISSION

IN RE DETERMINATION OF THE NAVIGABILITY OF THE SANTA CRUZ RIVER FROM THE MEXICAN BORDER TO THE CONFLUENCE WITH THE GILA RIVER: SANTA CRUZ, PIMA, AND PINAL COUNTIES, ARIZONA	No. 03-002-NAV THE SAN CARLOS APACHE TRIBE'S FINDINGS OF FACT AND CONCLUSIONS OF LAW

The San Carlos Apache Tribe ("Tribe") submits its Findings of Fact and Conclusions of Law on the navigability of the Santa Cruz River ("River" or "Santa Cruz") in its ordinary and natural condition as of the date of Arizona's statehood, February 14, 1912.

FINDINGS OF FACT

I. Summary of Evidence in the Record

1. The Arizona Navigable Stream Adjudication Commission ("ANSAC" or "Commission") held a public hearing in Tucson on January 22, 2004, at which time ANSAC heard testimony and received and considered evidence regarding the navigability of the Santa Cruz River. That evidence and testimony is included in the Record.

2. ANSAC held a public hearing in Nogales, Arizona on March 11, 2003, at which time ANSAC heard testimony and received and considered evidence regarding the navigability of the Santa Cruz River. That evidence and testimony is included in the record.

3. ANSAC held a public hearing in Florence, Arizona on March 9, 2004, at which time ANSAC heard testimony and received and considered evidence regarding the navigability of the Santa Cruz River. That evidence and testimony is included in the record.

4. ANSAC held public hearings in Tucson, Arizona on March 28, 2014 at which time ANSAC heard testimony and received and considered evidence regarding the navigability of the Santa Cruz River. That evidence and testimony is included in the record;

5. On page 27 of its *Report, Findings and Determination Regarding the Navigability of the Santa Cruz River from the Mexican Border to the Confluence with the Gila River* (October 18, 2006) ("Santa Cruz Findings"), ANSAC found "the Santa Cruz River was not used or susceptible of being used, in its ordinary and natural condition, as a highway for commerce, over which trade and travel were or could have been conducted in the customary modes of trade and travel on water as of February 14, 1912."

6. A comprehensive study prepared by SFC Engineering Company, in association with George V. Sobel Consulting Engineers, J.E. Fuller Hydrology and Geomorphology, Inc., SWCA Inc., University of Arizona Water Resources Research Center, and the Arizona Geological Survey, on behalf of the State Land Department *See Arizona Stream Navigability Study for the Santa Cruz River: Gila River Confluence to the Headwaters* (November 1996) ("Santa Cruz Report").

7. A revised Santa Cruz Report was issued in 2004. *See* J.E. Fuller Hydrology and Geomorphology, Inc., SWCA Inc., University of Arizona Water Resources Research Center and the Arizona Geological Survey. *See* Arizona Stream Navigability Study for the Santa Cruz River: Gila River Confluence to the Headwaters (January 12, 2004) ("SCR Study") at § 3-64 (finding that the Santa Cruz River was used as a transportation and settlement corridor in historic times but that "no archeological evidence of navigation along the Santa Cruz River has been found.")

8. A paper submitted by Jack August entitled, The Upper Santa Cruz River: History of Lessening Stream ("August Report I") stated that the Santa Cruz River was never

navigable and no evidence exists to suggest that it ever was navigable. August Report I at 144.

9. Leonard Halpenny submitted a Review of the Hydrogeology of the Santa Cruz Basin in the Vicinity of the Santa Cruz-Pima County Line. Halpenny presented a paper at the first annual conference of the Arizona Hydrological Society, Phoenix, Arizona on September 16, 1988 ("Santa Cruz in 1804"). It stated that "[o]nly in the rainy season does it enjoy a steady flow. During the rest of the year it sinks into the sand in many places... the upper Santa Cruz from approximately 1804 thru at least 1852 was often dry, would flow only during the rainy seasons, but not always even at times of considerably heavy rains." (Cited in SCR Study at § 3-1 and § 3-2).

10. Supplemental Evidence provided by the Gila River Indian Community ("GRIC"), included 41 referenced materials ("GRIC Materials"). Included in those materials is a paper entitled *Stream Flow in the Upper Santa Cruz River Basin, Santa Cruz and Pima Counties* (USGS Water-Supply Paper 1939-A). Washington DC: U.S. Government Printing Office. The USGS Water-Supply Paper stated at page A9 that "[s]treamflow in the upper Santa Cruz River basin is extremely variable, and the arithmetic average of the annual flow has little meaning with regard to the annual flow that may be expected each year." It also stated on page A20 that "[s]treamflow in the upper Santa Cruz River basin is of small quantity and large variability and causes occasional flooding." Also included in the GRIC Materials is the U.S.G.S. Open-File Report 93-41 entitled, Channel Change on the Santa Cruz River, Pima County, Arizona 1836 – 86 by John T.C. Parker ("U.S.G.S. File Report"). The U.S.G.S. File Report stated on page 1 that "The Santa Cruz River . . . has a long history of channel instability. . . . The nature, magnitude, location and frequency of channel change on the Santa Cruz River have been highly variable in time and space . . . . The timing and magnitude of channel change at a particular location are controlled primarily by hydrologic and climactic factors such as magnitude, duration, intensity, and frequency of precipitation and floods." U.S.G.S File Report at 1)

11. A number of individuals submitted documents and testimony to the Commission in connection with the initial 2003-2004 Public Hearings. The record includes 23 filings from various sources. Those documents remain part of the evidentiary record supporting the navigability or non-navigability of the Santa Cruz River respectively. This evidence was used to support the Commission's initial and correct determination that the Santa Cruz River was not navigable or susceptible to navigation for the purposes of trade and travel at the time of Arizona statehood, February 12, 1914.

12. In the Declaration of Richard Burtell on the Non-Navigability of the Santa Cruz River At and Prior to Statehood dated October 2013 ("Burtell Declaration"), filed as supplemental evidence by Freeport-McMoRan Corporation on October 18, 2013, (Mr. Burtell discussed the existing evidence in the record and the supplemental evidence filed as of October 2013. He concluded that "the Santa Cruz River was not susceptible to navigation in its ordinary and natural condition at and prior to statehood...." Burtell Declaration at 1.

13. In a report by Win Hjalmarson on behalf of the Arizona Center for Law in the Public Interest ("ACLPI") and its clients entitled *Navigability Along the Natural Channel of the Santa Cruz River: From the Mexican Border to the Mouth of the Gila River near Buckeye, Arizona – An Assessment Based on History, Hydrology, Hydraulics and Morphology*, dated March 20, 2014 ("Hjalmarson Report 2014"), Mr. Hjalmarson criticized the methods used by Richard Burtell in the Burtell Declaration to conclude that the Santa Cruz was not navigable or susceptible to navigation at and prior to statehood. Hjalmarson Report 2014 at 98. Mr. Hjalmarson did not testify or attend a hearing to explain his critique of the Burtell Declaration or to rebut Mr. Burtell's clarification and support of his methodology.

14. In the Testimony of Richard Burtell at the Santa Cruz River Navigability Hearing on March 27, 2014 in Tucson, Arizona, Mr. Burtell discussed his Declaration and the methods he used to make his ultimate determination that the Santa Cruz River was never a navigable watercourse or susceptible to navigation. Mr. Burtell also provided evidence supporting his analysis and calculation which Mr. Hjalmarson had criticized in his report.

Hjalmarson Report at 98. The critique of the Burtell Declaration by Mr. Hjalmarson was not supported by any other evidence in the record, and since Mr. Hjalmarson did not testify or attend the March 28, 2014 Santa Cruz River Navigability hearing, no clarification for his remarks concerning the Burtell Declaration could be made.

15. The *Memorandum for the Record; Determination of Two Reaches of the Santa Cruz River as Traditionally Navigable Waters*, signed by Colonel Thomas H. Magness, U.S. Army District Commander, dated May 23, 2008 ("TNW Determination") concluded that two reaches of the Santa Cruz River are navigable-in-fact. As a result, the U.S. Army Corps of Engineers ("Corps") labeled those sections of the Santa Cruz "traditionally navigable waters" ("TNW"), in accordance with 33 C.F.R. § 328.3(a)(1). ACLPI filed the TNW Determination in the record for this matter to support its contention that the Santa Cruz River was navigable at the time of Arizona's statehood, February 14, 1912. The TNW Determination, however, does not support ACLPI's argument that the Santa Cruz River was navigable or susceptible to navigation at the time of Arizona statehood. The TNW Determination is based on three factors that do not fit the criteria for determining whether a river is navigable-in-fact for the purposes of these proceedings. The TNW Determination is based on the belief that the Santa Cruz *could* be navigable in the *future*. TNW Determination at 5 (emphasis added). This belief is based on the flow rates of the River, made up of mostly sewage effluent water from an upstream wastewater treatment plant. *Id.* at 2-4. In addition, the flow data used is an accumulation of post-statehood measurements which do not represent the Santa Cruz's flow in its "ordinary and natural" condition at or around February 14, 1912. *Id.* at 2-4. The TNW Determination cites two instances of people who claim to have navigated the River, first in 1994, and the second in 2005. These post statehood claims are not evidence that the Santa Cruz River was navigable in its ordinary and natural condition on the date of Arizona Statehood, February 14, 1912. *Id.* at 5. Finally, the TNW Determination claims that because the two relevant portions of the Santa Cruz have public access, the River is currently susceptible to navigation. *Id.* Public access to the Santa Cruz, however, has no bearing on

whether a boat of the type commonly used at the time of statehood for the purposes of trade or travel could travel on the Santa Cruz when the River was in its ordinary and natural condition, at the time of Arizona statehood . The terms "navigable" and "navigate" are used in the TNW Determination, however, those terms have a different meaning and application in the TNW Determination than when those words are used to determine whether a river is navigable-in-fact.

16. *A Complete Documentary History of the Controversial TNW Decision* ("Complete Documentary History of the TNW") was filed as supplemental evidence by the San Carlos Apache Tribe on April 18, 2014. These documents include email discussions and inter-office memoranda that deal with the methods and evidence used by the Corps to justify the TNW Determination, which concluded that two reaches of the Santa Cruz River are Traditionally Navigable Waters. The Complete Documentary History of the TNW shows that the justifications for the determination that certain sections of the Santa Cruz River were traditionally navigable for purposes of jurisdiction to enforce water quality laws, are different from the use of the terms "navigable" and "navigability" when applied to the navigable-in-fact question posed to the Commission. The TNW Determination is based on a stream that is made up mostly of effluent water from an upstream wastewater treatment plant, current accessibility to the banks of the River by tourists, and almost exclusively post-statehood accounts of navigation. The factors that support the Corps' TNW Determination are meant to serve a different purpose from the Commission's determination of the navigable-in-fact question. The TNW Determination is not relevant evidence for the Commission to use and consider when determining if the Santa Cruz River was navigable or susceptible to navigation at the time of Arizona's statehood February 14, 1912.

II. History of the Santa Cruz River

The Commission finds as a matter of fact that the historical evidence in the record shows that the Santa Cruz River was not navigable or susceptible to navigation in its ordinary and natural condition at the time of Arizona's statehood, February 14, 1912.

III. Santa Cruz During Prehistoric Times

There is no evidence in the record to support a finding that the Santa Cruz was a navigable waterway in its ordinary and natural condition at the time of Arizona's statehood, February 14, 1912. SCR Study, at § 2 at 30. The Proponents of navigability have provided no evidence that any of the prehistoric human occupation of the Santa Cruz River basin ever used or attempted to use the Santa Cruz as a transportation means for trade or travel. The first cultures to take permanent residency along the Santa Cruz left an abundant amount of archeological evidence behind, none of which suggests that these groups utilized the Santa Cruz as a highway of commerce or a means of travel by watercraft. *Id.*

IV. Spanish Missionaries, Pioneers, and Colonizers

Evidence in the record overwhelmingly demonstrates that the Santa Cruz was used by Spanish missionaries, colonizers, miners, cattlemen, and travelers as a route to and throughout the Santa Cruz River Valley. *Id.* at 18. However, no evidence has been presented that these early explorers ever traveled by watercraft on the Santa Cruz or used the Santa Cruz as a means of trade, or a highway of commerce by watercraft. During these times, the Santa Cruz was reportedly dry for months at a time and not even heavy rains could be relied upon for flow, as there were reports that even during the rainy seasons the Santa Cruz would sometimes have no flow at all. *Id.* § 4 at 57.

In 1880, a surveyor with the U.S. Surveyor General documented at least 2 historical accounts of water occurrences in the upper reaches of the Santa Cruz. Both accounts discussed the presence of 'running water' on the upper Santa Cruz. Both accounts described the River as rising above the surface and disappearing beneath it throughout the entire upper course of the Santa Cruz. Burtell Declaration at 4. The middle section of the Santa Cruz river was also described in historical accounts which indicated that while there were a handful of sections of the Santa Cruz with regular water flow, those sections "were typically shallow (1 foot or less) and was in places, narrow." *Id.* at 5

V. Mining Development and Diversion

The record reflects a handful of small mining operations in the Santa Cruz Valley prior to statehood. SCR Study, at § 3 at 49. These mines were stifled from reaching full production potential due to the limited means by which to obtain the newest technologies. Had the Santa Cruz been considered navigable, miners and investors would have utilized the River as a means to transport goods and materials necessary for their mines to thrive. *Id.* at 35.

The only representation of the Santa Cruz as a wide river with any utilizable depth was a pamphlet created by a real estate promoter who was attempting to lure buyers and railroad operations to the Santa Cruz Valley based on his misrepresentation. *Id.*

Agricultural diversions and irrigation were intermittently interrupted throughout the Mexican, Spanish, and Early American periods, most often due to Apache unrest and water availability. Burtell Declaration at 6. At the height of the growing season, irrigation "would not have depleted, on average, at total of more than 10 to 20 cfs from the stream .... there were times when stream flows were insufficient even for this limited cultural demand." Id. at 6. These diversions would not have had a substantial impact on the River's susceptibility to navigation, because "[c]learly it would have been impractical to conduct commercial navigation under such flow conditions, even if there were no diversions." *Id.* at 6.

Evidence in the record shows that small mining operations had begun to pump water into their mines before Arizona became a state in 1912. However, Proponents of navigability have provided no proof that these activities had an impact one way or the other on the navigability of the Santa Cruz. *see* the Report, Findings and Determination Regarding the Navigability of the Santa Cruz River from the Mexican Border to the Confluence with the Gila River (October 18, 2006) ("ANSAC Report") at 27.

VI. Boating on the Santa Cruz

Evidence shows that the few attempts which were made to navigate the Santa Cruz in watercraft similar to those available and used in the ordinary method of trade and travel in Arizona in 1912, failed. *See* SCR Study § 3 at 20 and 32 (three sailors ran aground shortly

after leaving Nogales in 1914 due to the River's shallow depth and low flow; that same year the National Guard abandoned a rescue attempt to save people stranded on their rooftops during the rainy season because the strong and violent currents made using a rescue boat too dangerous; a lone diary entry by one traveler, retelling an anecdotal story about the naming of Canoa).

There is no evidence in the record that proves that watercrafts were ever used on the Santa Cruz for travel or commerce. Santa Cruz Findings, at 25.

The Proponents of navigability have failed to present any corroboration to support the Canoe incident, which purports to document a time a person constructed a watercraft to cross the Santa Cruz when a road was flooded. *See* Findings of Fact and Conclusions of Law, *infra*.

VII. Natural and Ordinary Condition of the Santa Cruz

Evidence in the record includes historic and post-statehood climate data, hydrologic evidence, and geomorphologic characteristics of the Santa Cruz. This evidence supports the finding that the Santa Cruz River was not navigable in its ordinary and natural condition at the time of Arizona statehood, February 14, 1912. Santa Cruz Findings, at 27.

The climatic date for the Santa Cruz River and Santa Cruz Valley show that the area is typical of arid climates. Evidence in the record demonstrates that the majority of the total precipitation in that area occurred during the summer monsoons. SCR Study, at § 4 at 6. The climate along the Santa Cruz resulted in the majority of "flow events" occurring during the summer rainy season. *Id.* at § 4-8. A smaller influx of flow occurred during the winter rains, however those storms were unreliable and erratic thus making the Santa Cruz non-navigable. *Id.* at § 4 at 5.

Hydrologic evidence in the record shows that the Santa Cruz was not navigable at the time of Arizona's statehood in 1912. Historic evidence in the record confirms that "prior to 1890, the Santa Cruz River was an intermittent stream with occasional marshlands and

cienagas." *Id.* at § 2 at 32. Evidence proves that "only the largest floods were sustained from the headwaters to the confluence with the Gila River." *Id.*at § 6 at 2.

The geomorphologic characteristics of the Santa Cruz show that the River was not navigable or susceptible to navigation. In its upper portions, the Santa Cruz was reportedly ill-defined, with a shallow braided channel unsuitable for navigation. *Id.* at § 4 at 58. The Commission's final determination of the Santa Cruz River as non-navigable was based on evidence in the record which illustrated these same characteristics: "[T]he Santa Cruz River, while considered to be a perennial stream, has an almost insignificant flow during the dry season of the year. As of February 14, 1912 and currently, the Santa Cruz flows/flowed primarily in direct response to precipitation and seasonal storms." Santa Cruz Findings at 28. The Santa Cruz has always been a river with wide braided channels and, "almost insignificant flow during the dry seasons of the year. *Id.* at 30.

The evidence in the record regarding the navigability of the Santa Cruz River shows that the Santa Cruz was unnavigable. The Santa Cruz, as a matter of fact, was unnavigable in its ordinary and natural condition on the date of Arizona's statehood, and it was not navigable or susceptible to navigation at any time in history according to archeological evidence, historical accounts, scientific data, and government reports.

Conclusions of Law

The Public Trust and Equal Footing Doctrine

1. Under the "public trust doctrine," the sovereign holds the beds of "navigable" watercourses in trust for the benefit of the public. *See Arizona Center for Law in the Public Interest v. Hassell*, 172 Ariz. 356, 837 P.2d 158 (Ariz. Ct. App. 1991).

2. The U.S. Supreme Court has held that under the Equal Footing Doctrine, as new states were admitted to the Union, each took title to the beds of the navigable watercourses within their boundaries just as the original thirteen states had done before them. 172 Ariz. at 359 (citing to *Pollard's Lessee v. Hagan*, 44 U.S. 212 (1845).

The Commission's Role

3. The Commission has exclusive jurisdiction to determine which, if any of the Arizona watercourses are "navigable" as of the date of Arizona statehood, February 14, 1912, and for any watercourses deemed navigable, to make a public report identifying any "public trust" values associated with said navigable water course. *See* A.R.S. §37-1123.

4. The Commission is required to make a finding of navigability or non-navigability for each watercourse "[b]ased only on evidence of navigability or non-navigability." A.R.S. § 37-1123.

5. The Commission has a statutory obligation for determining navigability of the watercourses in Arizona:

> If the preponderance of the evidence establishes that the watercourse is navigable, the Commission shall issue its determination confirming that the watercourse is navigable. If the preponderance of the evidence fails to establish that the watercourse is navigable, the commission shall issue its determination confirming that the watercourse is question is non-navigable.

A.R.S §37-1128(A).

6. The statute defines "navigable" or "navigable watercourse" as:

> A watercourse that was in existence on February 14, 1912, and at that time was susceptible to being used, in its ordinary and natural condition, as a highway for commerce, over which trade and travel were or could have been conducted in the customary mode of trade and travel on water.

A.R.S. § 37-1101(5).

7. A "highway for commerce" is defined as a "corridor or conduit within which the exchange of goods, commodities or property or the transportation of persons may be conducted." A.R.S. § 31-1101(3).

8. The Arizona statutory definition of "navigability" or "navigable watercourse" follows the Federal Test of navigability first laid out by the U.S. Supreme Court in 1870, known as the *Daniel Ball Test*;

> Those rivers must be regarded as public navigable rivers in law which are navigable-in-fact . And they are navigable-in-fact when they are

> used, or are susceptible of being used, in their ordinary condition, as highways for commerce, over which trade are travel or may be conducted in the customary modes of trade and travel on water.

The Daniel Ball, 77 U.S. (10 Wall.) 557, 563, 19 L.Ed. 999 (1870).

Burden of Proof

9. The Arizona Court of Appeals of Arizona confirmed that "the burden of proof rests on the party asserting navigability." *State of Arizona v. Arizona Navigable Stream Adjudication Comm'n*, 224 Ariz. 230, 238, 229 P.3d 242, 250 (Ariz. Ct. App. 2010). "Consequently the burden of proof lies with... the proponents of navigability, who must prove navigability by a preponderance of the evidence." 224 Ariz. at 239, 229 P.3d at 251. *See also* Arizona Revised Statutes ("A.R.S.") § 37-1128(A) (requiring that a claim of navigability be proven by a "preponderance of the evidence" and placing that burden on the Proponents of navigability).

10. In *North Dakota ex rel. Bd. of Univ. & Sch. Lands v. United States*, 972 F.2d 235, the Federal Court clearly placed the burden of proof on the Proponents of navigability. *See also Mundy v. United States* 983 F.2d 950 (1993), ("Navigability is a question of fact, and the burden of proof is on the party asserting navigability").

11. Whether or not a river is navigable is a question of federal law. The federal test requires that the Proponents of navigability prove, by a preponderance of the evidence, that at the date of statehood the Santa Cruz River was (1) used or susceptible of being used, (2) as a highway of useful commerce, (3) in its ordinary and natural condition, (4) by the customary modes of trade an travel. *North Dakota*, 972 F.2d at 238, *citing U.S. v. Holt State Bank*, 270 U.S. 49, 56 (1926).

12. Additionally, the Federal Test for navigability "must be assessed at the time of statehood...." *PPL Montana, LLC v. Montana*, 132 S. Ct. 1215, 1227, 1228, 1233 (2012) ("*PPL Montana*").In the case of the Santa Cruz River, the date in question is February 14, 1912. The Arizona state statutes reinforce the requirement that the date of statehood is the key date of inquiry, defining a "navigable watercourse" as a watercourse "that was in

existence on February 14, 1912, and at that time was used or was susceptible to being used, in its ordinary and natural condition, as a highway of commerce, over which trade or travel could have been conducted in the customary modes of trade and travel on water. A.R.S. § 37-1101(5).

13. Allegations of isolated or sporadic attempts at navigation, standing alone, are not enough to support a determination of navigability on the key date of statehood. The Supreme Court stated that "[w]hile the Montana court was correct that a river need not be susceptible to navigation at every point during the year, neither can that susceptibility be so brief that it is not a commercial reality." *PPL Montana* at 1234.

14. "Statutory provisions must be considered in context of entire statute and consideration must be given to all statute's provisions so as to arrive at legislative intent manifested by entire act". *One Hundred Eighteen Members of Blue Sky Mobile Home Owners Ass'n v. Murdock* 140 Ariz. 417, 682 P.2d 422 (App. Div.1 1984). When applying the Arizona Statute that defines a navigable watercourse, the Commission must ensure that "no clause, sentence, or word is rendered superfluous, void, contradictory or insignificant". *State v. Superior Court for Maricopa County* (1976) 113 Ariz. 248, 550 P.2d 626. See also *Adams v. Bolin* 74 Ariz. 269, 247 P.2d 617 (1952); *City of Phoenix v. Yates* 69 Ariz. 68, 208 P.2d 1147 (1949).

15. The Commission concludes as a matter of law that the Proponents of navigation have not met their burden of proof.

DATED this 15th day of April, 2014.

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