SANTA CRUZ COUNTY

BEFORE THE
ARIZONA NAVIGABLE STREAM ADJUDICATION COMMISSION

IN THE MATTER OF THE NAVIGABILITY OF SMALL AND MINOR WATERCOURSES IN SANTA CRUZ COUNTY, ARIZONA, EXCLUDING THE SANTA CRUZ RIVER	No.: 03-001-NAV

REPORT, FINDINGS AND DETERMINATION REGARDING THE NAVIGABILITY OF SMALL AND MINOR WATERCOURSES IN SANTA CRUZ COUNTY, ARIZONA

Spanish travelers or settlers in Santa Cruz County until 1691 when a Jesuit missionary, Father Eusebio Francisco Kino came to the valley to establish missions and convert indigenous populations to Christianity. The impact Father Kino had on Santa Cruz County, either directly or indirectly, cannot be underestimated.

The first large settlement of the area was the Jesuit mission of Santa Maria Soamca, later known as Santa Cruz. which was located south of the border in Mexico. Father Kino used the Santa Cruz valley extensively as a travel route into the northern portion of Pimeria Alta. His missionary efforts in the twenty years between 1691 and his death in 1711 led to the establishment of three missions along the Santa Cruz River, including Tumacacori just north of Nogales. Other smaller mission posts and visitas were established at Tubac and north of Santa Cruz County at San Xavier del Bac and San Augustine de Tucson. The greatest impact Kino and subsequent missionaries had in Santa Cruz County, and especially the Santa Cruz valley, was the introduction of new technologies in crops and domestic animals. This led to an expansion of farming by the Pima Indians and Spanish settlers. The missions' crops relied on irrigation primarily from the Santa Cruz River, although Sonoita Creek was also used where surface waters flowed through canals, some of which may have been originally dug by the Hohokam. The missionaries brought cattle, sheep and goats into the area from herds maintained further south in Mexico.

A Presidio was established at Tubac in 1751 and one was established at San Augustine del Tucson in 1757, although they were defended or manned only intermittently. In 1757 the Jesuits were expelled from New Spain and the Franciscans entered the area, taking their place and taking charge of a seriously deteriorated mission system. The church at Tumacacori was completed by the Franciscans in 1822, although prior to completion it was a center of missionary activity. In 1775 Captain Juan Batista de Anza with a troop of soldiers came to Santa Cruz County where the missions were under pressure from marauding Apaches. His efforts resulted in a secure environment for settlers and missions for a number of years. Along with salutary effects, Europeans brought disease which had a devastating effect on Indian populations in Santa Cruz County since they were not immune to western European diseases.

Although mining on a small scale had been practiced for centuries by the Indians, primarily in small silver mines in the Santa Rita Mountains, the Spanish expanded the mining activity and attempted to establish gold and silver mines, but they were not particularly successful in this endeavor. In order to encourage settlement in Pimeria Alta, the Spanish government in the 17th and 18th centuries made certain land grants to individuals who would go into the area and develop large ranches and haciendas. After 1821, when Mexico became free of Spain, it continued this practice. There are a number of claims of land grants in the Santa Cruz County area, the oldest

being Tumacacori-Calabasas which dates from 1806, and the most famous land grant, Baca Float No. 3 just north of Nogales.

Following the war between the United States and Mexico whereby the United States acquired all of the Mexican territory north of the Gila River, gold was discovered in California and southern Arizona became a major route to the gold fields of California. One of the best routes was south of the Gila River, and the United States undertook to purchase from Mexico enough land to allow a southern transcontinental route. This was accomplished by the Gadsden Purchase of 1853 whereby the United States acquired the land south of the Gila River to the present international boundary which encompasses all of Santa Cruz County. In the 1850's surveys were conducted to locate railroad and road routes through southern Arizona to California and south to Mexico. The Butterfield Stage Line was established in 1857 from San Antonio through southern Arizona, stopping at Tucson on its way to San Diego and Los Angeles. This route was north of Santa Cruz County but allowed travelers to go south from Tucson to Nogales and on into Mexico via a secondary stage line. After the Civil War, a number of military posts were established in Arizona to quell the marauding Apaches, including Camp Crittenden, twelve miles north of Patagonia, Camp Wallen, Camp Cameron, and Ft. Huachuca to the east of Santa Cruz County in Cochise County.

The Southern Pacific Railroad was completed from New Mexico across the state to California in the late 1870's and early 1880's, with a major stop in Tucson. Other

railroad lines were built connecting Tucson with Nogales which grew in size and importance because of the railroad. With the capture of Geronimo in 1886, the Indian Wars were at an end which allowed the expansion of commerce, mining and ranching in southern Arizona. In the late 1800's a great number of cattle were brought to Arizona and large cattle ranches were established. One of the largest was the Empire Ranch in Santa Cruz County, with almost one million acres and 12,000 cattle in 1903. Ditches and diversion dams were built to divert water for crops and cattle. Groundwater pumping was brought into the area in 1890 which expanded the number of crops grown and which, compounded with the need for water for mining activities and additional water for the increasing population, eventually lowered the water table. Droughts followed by severe storms, coupled with human activity, resulted in flooding which caused a great deal of erosion and arroyo cutting in southern Arizona, especially in the Santa Cruz River channel and its tributaries.

In the 1890's and early 1900's the Santa Cruz River, as well as some of its tributaries and other watercourses, such as Sonoita Creek, Cienega Creek and Arivaca Creek, were considered to be perennial and water was diverted for irrigation purposes. There are also reports of fish being caught in pools along the perennial flow areas of these streams. A number of mines were established in Santa Cruz County in the late 1800's and early 1900's. Towns such as Ruby, Oro Blanco, Harshaw, Washington Camp, Duquesne, and Lochiel grew up around these mines but were abandoned when

the mines closed. Mining activity in the late 1800's and since statehood has required a great deal of water, resulting in a lowering of the water table and drying of the streams in Santa Cruz County. By 1910 the entire base flow of the Santa Cruz River, as well as Sonoita Creek at both Nogales and to the north, was diverted for agriculture, leaving the mines to pump subsurface water for their operations. Thus, by 1912 none of the watercourses in Santa Cruz County could be considered as perennial with any substantial flow of water.

Although the streams and watercourses in Santa Cruz County have never, within history or known prehistory, been considered as navigable, some did have characteristics of perennial flow, but additional requirements for water by mining activities, agriculture, and general requirements due to increased population, diminished the amount of water available by significant amounts by 1912. As of the date of statehood, while there was still some flow in the upper reaches of the Santa Cruz River, Sonoita Creek and Cienega Creek, and possibly others, they would have to be considered generally ephemeral or intermittent at best. The Santa Cruz River, Sonoita Creek and other streams and watercourses served as overland trade routes from prehistoric times to the present, but there is no documented record of any trade or travel on any of these streams during the period leading to statehood or since that time. Travel in Santa Cruz County was by foot, horseback, wagon, pack mule, stagecoach, and trains during the period around statehood. As the road system increased,

automobiles and trucks became more important for transportation and travel. None of the streams in Santa Cruz County has been listed in the Rivers and Harbors Act of 1899 (33 U.S. Code § 401-467e).

Testimony presented to the Commission at the hearing established that the present climate and weather conditions in Santa Cruz County are the same or very similar to that which existed in 1912 when Arizona became a state.

C. Title Issues on Lands Covered by Mexican and Spanish Land Grants

In the course of a hearing on the Santa Cruz River, the owners of Rio Rico Properties, Inc., by and through their attorneys, filed a memorandum with the Commission claiming that the Commission and the State of Arizona had no jurisdiction to consider the navigability of that portion of the Santa Cruz River encompassed within their property. Rio Rico Properties, Inc. is the successor in interest to the heirs of Luis Maria Cabeza de Baca, who acquired a land grant from the Spanish government, later confirmed by the Mexican government in 1821, known as the "Las Vegas Grandes" near Las Vegas, New Mexico. Since this grant was in conflict with another later grant (1835—Town of Las Vegas), Congress passed an Act in June of 1860 (12 Stat. 71, c. 167) allowing the heirs of Cabeza de Baca to select an equal quantity of vacant land, not mineral, in the Territory of New Mexico, to be located by them in square bodies not exceeding five in number. In 1863, as one of the five parcels, the Baca heirs selected the

tract known as Baca Float No. 3, which is the area encompassed by the property now owned by Rio Rico Properties, Inc.[3]

The position of the holders of what was formerly Spanish or Mexican Land Grant land is that the original Land Grant was made prior to the Treaty of Guadalupe Hidalgo (9 U.S. Stat. 922, Feb. 2, 1848) ending the war between the United States and Mexico and also before the treaty formalizing the Gadsden Purchase (10 U.S. Stat. 1031, Dec. 30, 1853) whereby the United States bought from Mexico the area south of the Gila River to the present international border. Both of these treaties provided that the United States would honor property rights and titles in land held by Mexican citizens prior to the date of the treaties. Because there were no title restrictions under the Mexican Land Grants and there is a question whether Mexican law recognizes the public trust doctrine as we know it (whereby the title to land under tidal waters and navigable rivers and the banks thereof was held by the sovereign for the benefit of all the people), it is their position that their title to the land covered by the Spanish or Mexican Land Grants should be absolute and not subject to the public trust doctrine. In support of their position, they cite *City and County of San Francisco v. Le Roy*, 138 U.S. 656, 11 S.Ct. 364, 34 L.Ed. 1096 (1891); *Knight v. United Land Association*, 142 U.S. 161, 12 S.Ct. 258, 35 L.Ed. 974 (1891); *Shaw v. Kellogg*, 170 U.S. 312, 18 S.Ct. 632, 42 L.Ed. 1050 (1898); *United States*

[3] In American land law, particularly in the western states, a Float is a certificate authorizing the entry by the holder of a certain quantity of land not yet specifically selected or located. Black's Law Dictionary, 5th ed. 1979.

v. Coronado Beach Co., 255 U.S. 472, 41 S.Ct. 378, 65 L.Ed. 735 (1921); *Lane v. Watts*, 234 U.S. 525, 34 S.Ct. 965, 58 L.Ed. 1440 (1914).

Le Roy, Knight and *Coronado* all dealt with tidelands, which under common law would be held to be owned by the state under the public trust doctrine, but since the land grants predated the acquisition of the land by the United States, the owner under the land grants held title from Mexico and the land was not subordinate to the state's claim of sovereignty under the public trust doctrine.

The case of *Beard v. Federy*, 70 U.S. 478, ___S.Ct.___, 18 L.Ed. 88 (1865) involved a claim by the Bishop of Monterey to church lands at the Mission of San Jose who had acquired them from Spain in 1797 against a grantee of the Governor of California in 1846. The Court confirmed the church's title holding that "... the right or title is derived from the Spanish or Mexican government, and it may in some instances rest in the general law of the land, as is the case usually with the title of municipal bodies, under the Spanish and Mexican systems, to their common lands." The Court went on to state that the acquisition of California by the United States did not affect the property rights of its inhabitants and that the grant to the church deriving from the Spanish government, which was the source of Federy's title having been confirmed by a patent from the United States, was superior to the claim of Beard whose claim derived from a deed by the governor of California.

In its decision in *City of Los Angeles v. Venice Peninsula Properties*, 31 Cal.3d 288, 644 P.2d 792, 182 Cal.Rptr. 599 (1982), the Supreme Court of California held that a Mexican land grant in 1839 which included tidelands was subject to the public trust interest of the State of California which was acquired under the equal footing doctrine from the United States when California became a state. Two very strong dissenting opinions object to the extension of the public trust doctrine by the majority and noted that the issue of whether a public trust exists is a question of federal law and not state law, and that all of the federal cases suggest the position that the federal patent issued confirming title as a result of a land grant overrides the state's claim to the land under the public trust doctrine.

The Supreme Court of the United States overruled the above decision of the California Supreme Court in *Summa Corp. v. California*, 466 U.S. 198, 104 S.Ct. 1751, 80 L.Ed.2d 237 (1984), holding that a patent issued under the Act of 1851 to confirm titles in Mexican and Spanish land grants were "pursuant to the authority reserved to the United States to enable it to discharge its international duty with respect to lands which, although tideland, had not passed to the states" under the equal footing doctrine. Also, if California desired to submit a public trust claim, it had to do so in the original confirmation proceedings resulting in the issuance of the patent. Its failure to do so results in its claim being barred, citing *United States v. Coronado Beach Co., supra.*

Based on the foregoing, it appears that the claim that the public trust doctrine does not apply to streams and watercourses encompassed in Mexican and Spanish land grants on which title has been confirmed and a patent issued has considerable merit. However, in view of our finding and determination of nonnavigability, we need not make a specific finding as to jurisdiction.

VIII. Separate Detailed Stream Navigability Study for Cienega Creek

Since Cienega Creek survived the level three analysis of small and minor watercourses in Santa Cruz County, a separate and detailed study of its navigability and susceptibility for navigation was conducted. The separate report on Cienega Creek is incorporated in this Report, Findings and Determination, although a portion of Cienega Creek is located in Pima County which is adjacent to Santa Cruz County to the north.

The headwaters of Cienega Creek are in the Canelo Hills in Santa Cruz County in the Southwest Quarter of Section 20, Township 21 South, Range 17 East, Latitude 31° 35.2′ North, Longitude 110° 38.8′ West. It flows north for 31.2 miles and has a drainage area or watershed of 457 square miles. It crosses the county line into Pima County at a point near Vail, Arizona, and flows in a northwesterly direction to the Colossal Cave Road crossing where its name is changed to Pantano Wash in the Northwest Quarter of Section 24, Township 16 South, Range 17 East, Latitude 32° 03′ North, Longitude 110° 41.9′ West. The watershed is bounded by the Rincon Mountains to the north, the

Whetstone Mountains to the east, the Canelo Hills to the south, and the Santa Rita Mountains to the west. Elevations within the watershed range from 9,400 at Mt. Wrightson in the Santa Rita Mountains to 3,200 feet at the Colossal Cave Road crossing.

Cienega is a Spanish word meaning a marsh or swamp. Literally, the word means "hundred (cien) waters (agua)" and carries the connotation of a rich combination of flowing water, stagnant water, stream flow springs, and shallow ground water. Cienega Creek was named for the cienegas that were once found along its river valley prior to settlement of the area by Anglo-Americans.

A. History of the Cienega Creek Valley

Archaeological finds disclose that the Cienega Creek valley has a history of human occupation dating from at least 1000 B.C. and possibly earlier. The Hohokam culture became established in the valley and continued from the year 1 to approximately 1400 A.D. The prehistoric and early historic settlement in Santa Cruz County discussed in Section VII B 1 and 2 above apply in general to the Cienega Creek valley and will not be generally repeated here.

The exploration of the area by the Spanish began in the 1600's. In 1699 Father Eusebio Francisco Kino, a Jesuit missionary delivered 150 head of cattle to the Rancheria Sonoita located near the headwaters of Cienega Creek. In the 1780's the Spanish Crown granted large land holdings to cattlemen in the form of land grants which were fairly

successful. However, between 1831 and 1850 Apache raids drove many of these cattle ranches out of business.

The California gold rush of 1849 brought an influx of Anglo-American travelers from the east on their way to California. In November of 1856 the Army established Camp Moore, a temporary tent camp near the Rancho of Calabasas. It was closed the following year and replaced by Ft. Buchanan which was located on the right bank of Sonoita Creek about 25 miles east of Tubac. These posts were established to stop the Indian raids and protect the ranching settlers in the area. Ft. Buchanan was closed in July 1861 when the Army withdrew most of its troops from Arizona to fight the Civil War in the east. The Butterfield Stage Line was established in 1857 and ran stagecoaches from San Antonio to San Diego. Its route crossed the northern end of the Cienega Creek valley. It, too, ceased operations at the commencement of the Civil War.

Following the Civil War, the Army again established posts in Arizona to protect the settlers from Indian raids. Among these was Camp Crittenden which was established approximately 12 miles north of Patagonia, and its troops patrolled the entire Cienega Creek valley. Camps Wallen and Cameron were also established in that area but were kept open for only two to three years. Camp Crittenden was closed in June of 1873, and its duties were assumed by Ft. Huachuca at the base of the Huachuca Mountains in Cochise County and Ft. Lowell in Tucson.

The Southern Pacific Railroad began service across the northern end of the valley in 1877. The New Mexico and Arizona Line was built between Nogales and Benson through the southern end of the valley along Sonoita Creek in 1881 and 1882 to connect the Southern Pacific Railroad with the Sonoran Railroad in Mexico. Transportation through the Cienega Creek valley prior to and at the time of statehood was by foot, horseback, horse-drawn wagon, or railroad. There is no record of any commercial, recreational or any other type of boating on Cienega Creek prior to or after statehood. Likewise, there is no history of commercial fishing on Cienega Creek.

The modern history of the Cienega Creek valley is largely the history of the Empire Ranch which began in 1876 and expanded to become one of the largest ranches in Arizona. In 1903 the Empire Ranch herd was over 12,000 cattle and the ranch covered almost a million acres. The owners of the Empire Ranch supported their ranching operation in part through the development of a mining operation called the Total Wreck Mine located on the western edge of the Cienega valley on the east flank of the Empire Mountains. By 1883 the silver production from this mine rivaled that of the most prosperous mines in the Arizona Territory. In 1884 a depression inn silver prices crippled the mining operation, and the owners closed it three years later when the ore yields fell too low to be profitable. In 1988 the Bureau of Land Management acquired a portion of the ranch lands in the Cienega valley and formed the Empire-Cienega Resource Conservation Area. The Cienega valley is currently proposed for inclusion as

part of the Last Cienegas National Conservation Area under the Las Cienegas NCA Establishment Act.

B. Wildlife, Habitat and Hydrology

According to records of early explorers and settlers, Cienega Creek prior to 1900 was a sluggish stream flowing through dense cienegas or bogs choked with tall grass. Cienega Creek has perennial, intermittent, and ephemeral reaches during normal times that reflect a variety of water supply, subsurface geology, and water use within the river valley. There is no evidence in the record to suggest that the location or alignment of the stream has changed significantly since 1900. The stream has supported and currently supports fish of the gila top minnow, gila chub, and long fin dace varieties within the perennial reaches, none of which is usable for commercial purposes.

The stream currently supports numerous mammals, amphibians, reptiles and birds. Mammals include javelina, mule deer, antelope, coyote, badger, rabbits, gophers and various other rodents. The vegetation of the Cienega valley is characterized as typical upper sonoran life zone. Grama, sacaton, and salt grasslands have support wild grazing animals for many centuries. The sacaton flats present during the first half of the 20th century have been invaded and dominated by moderately dense mesquite woods, with clusters of live oak along the upper drainages. Yucca and agave are found along the divide between the Cienega Creek and Davidson Canyon drainages. Cottonwoods,

willow and scattered populations of velvet ash occur along Cienega Creek, while oak and juniper woodlands thrive on the rolling hillsides of the valley.

There are few hydrological records from the year of statehood and earlier, but since that time two U.S. Geological Survey gauges have been established, one near Vail and the other at Pantano Wash in Pima County. The stream gauge at Vail indicates an average annual flow of 6.2 cfs, a depth of .02 to ½ foot, and a stream width of six to twenty feet. During unusual periods of high precipitation and flooding, the stream flow is much higher and recently ran as high as 2,600 feet. High seasonal flow occurs during the summer monsoon months of July through September. The largest flow ever recorded was on August 11, 1958 at 38,000 cfs, which probably equates to a 100 to 500-year flood. In 1911 a low surface dam was built near the present day community of Vail to force subsurface flow to the surface for diversion into ditches for agricultural uses and resulted in an increase of 1.4 cfs.

The bed itself consists of a sand and gravel bedded channel with low banks in its upper reaches lined by riparian vegetation and grassland. The main channel is straight to slightly sinuous and consists of a single or braided channel reaches. In the lower reach of the stream the creek flows within a well-defined canyon. The historical data suggests that Cienega Creek experienced arroyo cutting during the late 1800's and early 1900's when so many cattle were grazed on the range. This arroyo cutting is probably continuing, but at a lower rate. Comparison of the estimated flow characteristics for

Cienega Creek with federal boating criteria indicates that acceptable boating conditions do not exist during normal stream flow. There is no evidence in the record to suggest that Cienega Creek was ever used for commercial or recreational boating of any kind and, further, there was no evidence to suggest that flow conditions at or near the time of statehood would have allowed the flotation of logs or would have made the stream susceptible to any kind of boating except during infrequent flood events.

At all times since man first settled the area, transportation was accomplished by foot, horse, wagon or rail and, since statehood, as the road network was improved, by truck and automobile. There is no record of any boating or other use of Cienega Creek for passenger craft, commercial craft or recreational craft. In view of the foregoing, it seems clear that Cienega Creek was not navigable nor susceptible of navigability as of February 14, 1912.

IX Separate Detailed Stream Navigability Study for Sonoita Creek

Since Sonoita Creek survived the level three analysis of small and minor watercourses in Santa Cruz County, a separate and detailed study of its navigability was conducted. A separate report on Sonoita Creek, all of which is located in Santa Cruz County, is incorporated in this Report, Findings and Determination.

The headwaters of Sonoita Creek are near the town of Sonoita in the Northeast Quarter of Section 24, Township 20 South, Range 16 East, Latitude 31°41′ North, Longitude 110°39′30″ West. The creek flows in a southwesterly direction for 21.7 miles,

past the town of Patagonia, and has a watershed drainage area of 265 square miles. For the last eight to ten miles it flows in a westerly direction into the Santa Cruz River near the town of Rio Rico on the Luis Maria Baca Grant Float No. 3 at approximately Section 1, Township 23 South, Range 13 East, Latitude 32°27'42" North, Longitude 110°58'48" West. The watershed is bounded by the Santa Rita Mountains to the north, the Canelo Hills to the east, the Patagonia Mountains to the south, and the Santa Cruz River valley to the west. Elevations within the watershed range from over 9,400 feet at Mt. Wrightson in the Santa Rita Mountains to 3,400 feet at Rio Rico where the creek flows into the Santa Cruz River.

A. History of the Sonoita Creek Valley

Archaeological data indicate that human occupation of the Sonoita Creek area dates back to 2000 B.C. during the Archaic period or Cochise culture. It also indicates an extended period of occupation by the Hohokam culture from 100 A.D. to 1400 A.D. The prehistoric and early historic settlement of Santa Cruz County discussed in Sections VII B 1 and 2 above, apply in general to the Sonoita valley and will not be generally repeated here except as it specifically applies to the Sonoita valley.

The exploration of the area by the Spanish began in the 1600's when Father Eusebio Francisco Kino, a Jesuit missionary explorer delivered 150 head of cattle to the Rancheria Sonoita located near the headwaters of Sonoita Creek. No permanent missions were established in the Sonoita Valley. The Jesuits were replaced by the

Franciscans in 1767. From the early 1780's to the mid-1800's, the Spanish and later Mexican governments granted large land holdings to cattlemen in the form of land grants. In 1820 the San José de Sonoita Land Grant was issued by Mexico. This ranching was fairly successful until the 1830's when Apache raids drove many of the cattlemen away from their ranches to more populated areas where they could have some security.

The first Anglo-American settlement in the Sonoita valley was at Ft. Buchanan which was established on Sonoita Creek in 1857. The fort was built midway between the towns of Sonoita and Patagonia and was established to help protect new mining activity near Tubac and the surrounding hills from Apache Indian raids. Cattle ranching again flourished in the area to supply beef to the fort and to local miners. Ft. Buchanan was not completely effective in stopping Indian raids and was abandoned in 1861 at the outset of the Civil War. Camp Crittenden was established after the War in 1867 at almost the same location as Ft. Buchanan and was somewhat more successful but it, too, was abandoned in 1873 in favor of the location at Ft. Huachuca near Sierra Vista in Cochise County.

The first railroad through the valley was the New Mexico and Arizona Line which began service in 1881 and connected the Southern Pacific Line in southern Arizona at Benson to the Mexican Railroad at Nogales. In 1897 the Southern Pacific Railroad bought the New Mexico and Arizona Line, and Patagonia became established

as a major shipping area for cattle and mined ore. With the accessibility of transportation by rail, cattle ranching in the valley and mining in the surrounding hills flourished up to the turn of the century. Some of the ranchers built irrigation ditches from Sonoita Creek to irrigate fields supporting their ranching activity. A photograph of Sonoita Creek in 1912 shows a shallow surface flow, perhaps a few inches in depth and about 20 feet wide.

The economy of the Sonoita valley in the late 1800's and early 1900's was largely supported by mining and ranching, and crop agriculture played a minor role. The mining activity of the late 1800's in the Patagonia area diminished considerably and by the early 1900's the valley no longer had a major role in the mining economy. The ghost towns of Mowry, Duquesne, Harshaw, Washington Camp, and others bear testimony to the glory days of mining in the Sonoita valley. Ranching remained the major economic mainstay as of the time of statehood. The Rail X Ranch occupied much of the Sonoita valley during the early 1900's.

Transportation through the Sonoita valley in the late 1800's was primarily by foot, horseback, horse-drawn wagon or railroad. There is no record of boating or other use of Sonoita Creek to run passenger craft or typical commercial craft such as keelboats, steamboats or powered barges. The railroad was extremely important from the 1880's on, and during this period there was daily service from the valley, Patagonia, and even Benson, to the port of Guaymas on the Gulf of California in Mexico. Some

damage was done to the railroad and bridges through erosion during floods on Sonoita Creek in the early part of this century. Usage of this railroad declined due to the more direct route from Tucson to Nogales.

Other than using the water in Sonoita Creek for grazing of cattle and isolated uses for irrigation and for mining purposes, there is no indication that any other use was made of the stream at the time of statehood. Certainly it was not used for travel or commerce.

B. Wildlife, Habitat and Hydrology

The Sonoita Creek valley was and is home to a wide variety of wildlife and habitat. Vegetation along the stream included ash, sycamore, buttonwood, cottonwood, hackberry, black walnut, elm and mesquite. In the higher areas of the watershed, there were pines and other mountain species. The valley away from the creek was characterized by rolling grasslands. Wildlife in the area included mountain lion, wildcat, lynx, gray wolf, coyote, red fox, gray fox, brown bear, badger, polecats, weasel, raccoon, beaver, various species of squirrel, white and black-tailed deer, and javelina. Jaguars once roamed the valley but are no longer found in the area. The Nature Conservancy has listed 260 bird species found here, and four small native fish species have been found in the pools along the creek. There is no evidence to suggest that the location or alignment of the stream has changed significantly since 1900.

No Geological Survey stream gage data is available for the year of statehood, but a stream gauge was established near Patagonia in the following years and gives a good idea as to the stream flow of Sonoita Creek. The stream itself is considered perennial but during certain months of the year many of its reaches are dry. The average flow rate is 8.1 cfs. The larger flows occur during the winter and spring months due to snow runoff and as a result of the summer monsoons in July, August and September. On occasions of heavy precipitation there is substantial flooding and the largest recent peak flow, which was on October 2, 1983, was 16,000 cfs. In 1968 a dam was constructed across Sonoita Creek backing up a 640-acre lake known as Patagonia Lake which has altered the natural flow. By agreement with downstream landowners, the dam releases 3.3 cfs on average. In 1974 the lake was purchased by the State of Arizona and turned over to the Arizona State Parks Board for management as a recreational facility. The U.S. Geological Survey stream gauge data indicates an average of 8.1 cfs flows into the lake and is accumulated, and 3.3 cfs is normally released, although more may be released if the lake should fill up.

The main Sonoita Creek valley ranges from 10 to 20 miles wide, but the creek cuts an inner valley less than one-half mile wide to a depth of approximately 100 feet. The main channel of Sonoita Creek is a dry sand bed approximately 10 to 20 feet wide in most places. Low flows are typically braided, but seasonal floods fill the channel and flow in a single channel pattern. A comparison of the stream flows with the federal

guidelines for water boating discloses that Sonoita Creek does not generate acceptable flow depths for use even by canoes, kayaks and tubes in the ordinary course, much less by standard commercial craft. There is no reference in any of the historical data to commercial, recreational, or any other type of boating on Sonoita Creek, except on Patagonia Lake which was not built until 1968.

At all times since man first settled in the area, transportation was accomplished by foot, horse, wagon or rail and, since statehood, as the road network was improved, by truck and automobile. There is no record of any boating or other use of Sonoita Creek for passenger craft, commercial craft or recreational craft except on Patagonia Lake. In view of the foregoing, it seems clear that Sonoita Creek was not navigable nor susceptible of navigability as of February 14, 1912.

X. Findings and Determination

The Commission conducted a particularized assessment of equal footing claims the State of Arizona might have to the beds and banks of the 524 small and minor watercourses in Santa Cruz County, Arizona, and based on all of the historical and scientific data and information, documents, and other evidence produced, finds that none of the said small and minor watercourses, including Cienega Creek and Sonoita Creek on which separate detailed studies were conducted, were used or were susceptible to being used, in their 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.

The Commission also finds that none of the small and minor watercourses in Santa Cruz County, Arizona, are or were truly perennial throughout their length and that as of February 14, 1912, and currently they flow/flowed only in direct response to precipitation and are or were dry at all other times.

The Commission also finds that there is no evidence of any historical or modern boating having occurred on any of the small and minor watercourses in Santa Cruz County, Arizona.

The Commission also finds that there is no evidence of any fishing having occurred on the small and minor watercourses in Santa Cruz County, Arizona.

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

In view of the foregoing, the Commission, pursuant to A.R.S. § 37-1128A, finds and determines that the small and minor watercourses in Santa Cruz County, Arizona, including Cienega Creek and Sonoita Creek, were not navigable as of February 14, 1912.

DATED this 16TH day of December, 2003.

Earl Eisenhower, Chairperson

Jay Brashear, Member

Cecil Miller, Member

James Henness, Member

Dolly Echeverria, Member

Staff Members:

George Mehnert
Executive Director

Curtis A. Jennings
Legal Counsel to the Commission

The list of small and minor watercourses includes:
Alum Gulch, Babocomari River, Batamote Wash 1, Cave Creek, Cedar Creek 2, Cienega Creek 1, Diablo Wash, Fraquita Wash, Gardner Canyon S, Harshaw Creek, Josephine Canyon, O'Donnell Canyon, Oro Blanco Wash, Parker Canyon, Peck Canyon Creek, Potrero Creek, Redrock Canyon, Santa Cruz River, Saucito Wash, Sonoita Creek, Sopori Wash, Sycamore Canyon, Toros Wash, Tres Bellotas Canyon, Tubac Creek, Turkey Creek, Yellow Jacket Wash, and any other unnamed minor watercourses.

A

STATE OF ARIZONA
NAVIGABLE STREAM ADJUDICATION COMMISSION
1700 West Washington, Room 404, Phoenix, Arizona 85007
Phone (602) 542-9214 FAX (602) 542-9220
E-mail: **streams@mindspring.com** Web Page: **http://www.azstreambeds.com**

GEORGE MEHNERT
Executive Director

STATEMENT OF INTENT
State of Arizona
Navigable Stream Adjudication Commission

Pursuant to A.R.S. §37-1101, *et. seq.*, the Arizona Navigable Stream Adjudication Commission (ANSAC) is planning to hold a watercourse navigability hearing regarding all of the small and minor watercourses in Santa Cruz County, Arizona. Notice is hereby given, pursuant to A.R.S. §37-1123 (B), that ANSAC intends to receive, review, and consider evidence regarding the navigability or nonnavigability of all small and minor watercourses in Santa Cruz County. Interested parties are requested to file all documentary evidence they propose to submit to ANSAC by January 24, 2003. All evidence submitted to ANSAC will be the property of ANSAC and the State of Arizona. Evidence submitted will be available for public inspection at the ANSAC offices during regular office hours.

The list of small and minor watercourses includes:
Alum Gulch, Babocomari River - Santa Cruz, Batamote Wash 1, Cave Creek - Santa Cruz, Cedar Creek 2, Cienega Creek 1, Diablo Wash, Fraquita Wash, Gardner Canyon S, Harshaw Creek, Josephine Canyon, O'Donnell Canyon, Oro Blanco Wash, Parker Canyon, Peck Canyon Creek, Potrero Creek, Redrock Canyon, Saucito Wash, Sonoita Creek, Sopori Wash, Sycamore Canyon - Santa Cruz, Toros Wash, Tres Bellotas Canyon, Tubac Creek, Turkey Creek - Santa Cruz, Yellow Jacket Wash, and any other named or unnamed small and minor watercourses in Santa Cruz County.

An unbound original plus seven bound copies of documentary evidence is to be submitted. ANSAC offices are located at 1700 West Washington, Room 404, Phoenix, AZ 85007. The telephone number is (602) 542-9214. The web site address is http://www.azstreambeds.com. The e-mail address is streams@mindspring.com.

Individuals with disabilities who need a reasonable accommodation to communicate evidence to ANSAC, or who require this information in an alternate format may contact the ANSAC office at (602) 542-9214 to make their needs known.

B

STATE OF ARIZONA
NAVIGABLE STREAM ADJUDICATION COMMISSION
1700 West Washington, Room 404, Phoenix, Arizona 85007
Phone (602) 542-9214 FAX (602) 542-9220
E-mail: streams@mindspring.com Web Page: http://www.azstreambeds.com

GEORGE MEHNERT
Executive Director

NOTICE OF PUBLIC HEARING
January 3, 2003

State of Arizona
Navigable Stream Adjudication Commission

Pursuant to A.R.S. § 37-1126 (A), notice is hereby given that the Navigable Stream Adjudication Commission will hold a public hearing to receive physical evidence and testimony relating to the navigability or nonnavigability of all small and minor watercourses in Santa Cruz County. The hearing will be held in Santa Cruz County on February 11, 2003. The hearing will begin at 1:30 p.m. at the City Hall Complex Council Chambers at 777 North Grand Avenue, Nogales, Arizona 85621. This is presently the only hearing scheduled for the small and minor watercourses in Santa Cruz County.

The list of minor watercourses includes:
Alum Gulch, Babocomari River - Santa Cruz, Batamote Wash 1, Cave Creek - Santa Cruz, Cedar Creek 2, Cienega Creek 1, Diablo Wash, Fraquita Wash, Gardner Canyon S, Harshaw Creek, Josephine Canyon, O'Donnell Canyon, Oro Blanco Wash, Parker Canyon, Peck Canyon Creek, Potrero Creek, Redrock Canyon, Saucito Wash, Sonoita Creek, Sopori Wash, Sycamore Canyon - Santa Cruz, Toros Wash, Tres Bellotas Canyon, Tubac Creek, Turkey Creek - Santa Cruz, Yellow Jacket Wash, and any other named or unnamed minor watercourses in Santa Cruz County.

Interested parties may submit evidence to the commission office prior to the hearing. During the public hearing, the commission will receive additional evidence including testimony. The commission will conduct its hearings informally without adherence to judicial rules of procedure or evidence.

Evidence submitted in advance of the hearing will be available for public inspection during regular commission office hours of 8:00 a.m. to 5:00 p.m., Monday thru Friday, except on holidays. The commission office is located at 1700 West Washington Street, Room 404, Phoenix, Arizona 85007. Please call first to review evidence at (602) 542-9214.

Individuals with disabilities who need a reasonable accommodation to communicate evidence to the commission, or who require this information in an alternate format may contact the commission office at (602) 542-9214 to make their needs known.

Respectfully submitted,

George Mehnert, Director

Evidence Log

Hearing No. 03-001-NAV

Arizona Navigable Stream Adjudication Commission

Santa Cruz County Small and Minor Watercourses
March 11, 2003

Item Number	Received Date	Source to ANSAC	Description	Entry By
1	Received on various dates.	Evidence on hand at ANSAC previously submitted for watercourse hearings in Santa Cruz County and included in Commission report to legislature, 1 volume.	**Volume I of I.** 1. Letter from David Baron dated February 18, 1997. 2. Letter from Al Anderson dated December 26, 1997. 3. Letter from Mark Larken dated February 9, 1998. 4. Memorandum from Lee A. Storey dated February 19, 1998. 5. Comments and Exhibits submitted by Richard Lee Duncan February 22, 1998 6. Letter from James Braselton dated September 19, 1997. 7. Review of Hydrogeology submitted by Leonard and Philip Halpenny. 8. 1992 Boating Survey by Central Arizona Paddlers Club. 9. Santa Cruz River final report by SFC Engineering, George V. Sabol, SWCA, Inc., and J. E. Fuller, dated November 1996.	George Mehnert
2	6/9/00 approx	Evidence on hand at ANSAC.	Draft Final Report Small &Minor Watercourses Analysis for Santa Cruz County, Arizona dated June 9, 2000.	George Mehnert
3	8/1/00 approx	Evidence on hand at ANSAC.	Final Report Small &Minor Watercourses Analysis for Santa Cruz County, Arizona dated August 1, 2000.	George Mehnert
4	8/16/00 approx	Evidence on hand at ANSAC.	Computer printout pages of PowerPoint slide presentation by Stantec and Jon Fuller.	George Mehnert
5	9/?/98	Evidence on hand at ANSAC	Small and Minor Watercourse Criteria	George Mehnert
6	9/?/99	Evidence on hand at ANSAC	Final Report, 3 County Pilot Study	George Mehnert
7	1/22/03	Frank C. Brophy Jr	Ltr Re: Babacomari River (Creek), Tributary of the San Pedro River.	George Mehnert
8	3/11/03	Robert Sejkora	Water Program Memorandum from the Arizona Parks Board.	George Mehnert
9	3/11/03	Cheryl Doyle	Letter from the Arizona State Land Department.	George Mehnert

D

Meeting Minutes
Nogales, Santa Cruz County
Hearing Regarding Santa Cruz County Small and Minor Watercourses

March 11, 2003

COMMISSION MEMBERS PRESENT
Jay Brashear, Dolly Echeverria, Earl Eisenhower, James Henness, and Cecil Miller

COMMISSION MEMBERS ABSENT
None.

STAFF PRESENT
Curtis Jennings, George Mehnert, Tom Vogt.

1. CALL TO ORDER
Chair Eisenhower called the meeting to order at approximately 2:50 p.m. and reconvened the hearing on the Santa Cruz County Small and Minor Watercourses.

2. ROLL CALL
No break taken following Santa Cruz River hearing, therefore, all members were still present.

3. APPROVAL OF MEETING MINUTES (discussion and action).
Chairman indicated he would take care of regular business later and the meeting and that he wanted to move right into the small and minor watercourses hearing.
Motion: To approve meeting minutes of February 20, 2003.
Motion by: Jim Henness Second by: Dolly Echeverria Vote: All aye

4. SANTA CRUZ COUNTY SMALL AND MINOR WATERCOURSES HEARING (discussion and action).

The following people appeared and gave testimony or asked questions: Robert Sejkora, Jack August, Brad Woodford, V. Ottozawa-Chatupron,

CALL FOR PUBLIC COMMENT (comment sheets).
(Pursuant to Attorney General Opinion No. I99-006 [R99-002]. Public Comment: Consideration and discussion of comments and complaints from the public. Those wishing to address the Commission need not request permission in advance. Action taken as a result of public comment will be limited to directing staff to study the matter or rescheduling the matter for further consideration and decision at a later date.)

Chairman Eisenhower asked if there were any other questions or comments from anyone. There were none.

E

Motion: **To adjourn session on Santa Cruz River. Adjourned at 3:15 p.m.**
Motion by: Dolly Echeverria Second by: Cecil Miller Vote: All aye

Respectfully submitted,

George Mehnert, Director **Date: March 13, 2003**

4.0 Results

4.1 LEVEL 1 ANALYSIS

The application of the Level 1 sorting procedure to all small and minor watercourses in Santa Cruz County resulted into two data sets. The RL1 data set is comprised of all watercourses that test negatively for each criterion used in the Level 1 database query. This indicates that no characteristics of stream susceptibility to navigation are exhibited based upon known records and information. Level 1 analysis results indicate a significant percentage of the watercourses (96.6% or 506 records out of 524 total) test negatively to all Level 1 criteria and, therefore, do not justify further evaluation at Level 2.

The NLR1 data set is comprised of those watercourses that exhibit some characteristics of susceptibility to navigation based upon at least one affirmative response (hit) to the six criteria used in the Level 1 evaluation. Results of the analysis indicate that there are 18 watercourses (approximately 3.4%) in Santa Cruz County, which justify analysis at Level 2.

The summary listings for RL1 and NRL1 data sets are presented in Tables A-1A and A-1B in Appendix A. Ten (10) of the NRL1 watercourses are one-hitters and eight (8) watercourses tested affirmatively to more than one of the Level 1 criteria used in the database query.

The maps of RL1 and NRL1 data sets determined from the Level 1 sort are shown in Figure 8.

TABLE A-1A
RL1 Watercourses for Santa Cruz County

No. (1)	W_ID (2)	W_NAME (3)	SEGCOUNT (4)	W_COUNTIES (5)	W_MILES (6)	W_ADDRESS (7)	W_PER (8)	W_MBOAT (9)	W_HBOAT (10)	W_FISH (11)	W_DIMP (12)	W_SSTATUS (13)	HITS (14)
1	133	Batamote Wash 1	3	Pima/Santa Cruz	11.2927	T19.0S,R11.0E,S22	No	No	No	No	No	No	0
2	407	Cave Creek - Santa Cruz	3	Santa Cruz	5.8901	T20.0S,R16.0E,S07	No	No	No	No	No	No	0
3	657	Diablo Wash	1	Santa Cruz	5.1732	T20.0S,R13.0E,S18	No	No	No	No	No	No	0
4	797	Fraquita Wash	10	Pima/Santa Cruz	9.6541	T21.0S,R10.0E,S32	No	No	No	No	No	No	0
5	817	Gardner Canyon	7	Pima/Santa Cruz	20.0407	T19.0S,R17.0E,S10	No	No	No	No	No	No	0
6	37631	Harshaw Creek	11	Santa Cruz	14.3586	T22.0S,R16.0E,S05	No	No	No	No	No	No	0
7	37765	Josephine Canyon	6	Santa Cruz	18.7166	,,SLG	No	No	No	No	No	No	0
8	38443	Saucito Wash	1	Santa Cruz	4.1945	T20.0S,R11.0E,S07	No	No	No	No	No	No	0
9	38548	Sopori Wash	17	Pima/Santa Cruz	19.6681	T20.0S,R13.0E,S05	No	No	No	No	No	No	0
10	38729	Toros Wash	1	Santa Cruz	3.9785	T20.0S,R12.0E,S05	No	No	No	No	No	No	0
11	38738	Tres Bellotas Canyon	9	Santa Cruz	6.1966	T23.0S,R10.0E,S90	No	No	No	No	No	No	0
12	38756	Tubac Creek	2	Santa Cruz	4.4796	T21.0S,R13.0E,S12	No	No	No	No	No	No	0
13	38962	Yellow Jacket Wash	6	Pima/Santa Cruz	6.5086	T21.0S,R10.0E,S28	No	No	No	No	No	No	0
14	---	493 Unnamed watercourses	---	Santa Cruz	Varies	Varies	No	No	No	No	No	No	0

NOTES: The column headings are identified as follows:

W_ID: Unique ID number given to the watercourse.
W_NAME: Name of the watercourse.
SEGCOUNT: Number of segments merged together to comprise the watercouse.
W_COUNTIES: County(ies) where the watercourse is located.
W_MILES: Length of the watercourse in miles.
W_ADDRESS: Township, Range and Section of the mouth of the watercourse.
W_PER: Stream classification- perennial or not.
W_MBOAT: With modern boating or not.
W_HBOAT: With historical boating or not.
W_FISH: With fish or not.
W_DIMP: Impacted by dam or not.
W_SSTATUS: With special status designation or not.
HITS: Number of affirmative hits based on the six attribute data.

A-2

4.2 LEVEL 2 ANALYSIS

The NRL1 data set resulting from Level 1 analysis contains 18 watercourses. Results from the application of the Level 2 approach to the 18 watercourses are presented and discussed in the sections that follow. Employing the first-cut screening process shown in Figure 5 for the NRL1 data set leads to the classification of the watercourses as follows:

1. Stream *Category B* – navigation possible, not likely.

    a. Babocomari River – Santa Cruz
    b. Cienega Creek
    c. O' Donnell Canyon
    d. Parker Canyon
    e. Sonoita Creek
    f. Sycamore Canyon – Santa Cruz
    g. Turkey Creek – Santa Cruz
    h. 1 unnamed wash

2. Stream Category C – navigation unlikely.

    a. Alum Gulch
    b. Cedar Creek 2
    c. Oro Blanco Wash
    d. Peck Canyon Creek
    e. Potrero Creek
    f. Redrock Canyon
    g. 4 unnamed washes

Employing the second-cut filter screening process shown in Figure 6 and the criteria scoring matrix presented in Figure B-1 (see Appendix B) to establish a ranking system for the watercourses leads to the identification of a cut-off number that separates those watercourses rejected at Level 2 and those that are forwarded for Level 3 analysis. All watercourses with total ratings equal to or lesser than the cut-off number of 11.0 are classified under *Category C*. These watercourses comprise the RL2 data set, which are not forwarded for Level 3 analysis. On the other hand, the watercourses with total ratings more than the cut-off number of 11.0 are classified under *Category A*. These watercourses comprise those that are potentially susceptible to navigation and hence, are forwarded for Level 3 analysis.

To illustrate the use of the numerical weights for the refined approach, the case of Sonoita Creek in Santa Cruz County is considered (see Table A-2C, Appendix A). From the database, SonoitaCreek exhibits the information shown in Table 2 on the six criteria. The rating of 1.0 for perennial is evaluated from the fact that Sonoita Creek is classified as perennial by both ALRIS (1999) and Brown et al. (1981). The rating of 1.0 for dam-impacted is due to Patagonia Lake. The rating of 1.0 for fish is evaluated from the fact that both native and non-native fish species are documented for Sonoita Creek. Weights given to fish species are: 0.75 for native fish and 0.25 for non-native species. A total weight of 1.0 is evaluated from the sum of these two weights. The special status rating of 0.50 is evaluated from three special status designations described as riparian, preserve, and instream flow (application). Weights given to special status classifications are: 3.00 for instream flow (permit), 1.50 for instream flow (application), and 0.25 each for riparian, preserve, wild and scenic, and unique waters. A total weight of 4.0 is evaluated for any watercourse that has all these special status designations. The weighted average rating for any watercourse with special status is determined by dividing the total weight by 4.0. In the case of Sonoita Creek, the weigted average rating of 0.50 is evaluated from dividing 2.0 (i.e., 0.25 + 0.25 + 1.50) by 4.0.

Table 2
Evaluation of Total Rating

Criterion	Weights	Rating	Refined Rating	Notes/ Remarks
(2)	(3)	(4)	(5) = (3)x(4)	(6)
Perennial	7	1.00	7.00	Stream is perennial.
Historical Boating	10	0.00	0.00	No historical boating.
Modern Boating	8	0.00	0.00	No modern boating.
Dam-Impacted	4	1.00	4.0	It is dam-impacted.
Fish	4	1.00	4.0	Native and non-native fish species are present.
Special Status	2	0.50	1.0	Special status designations are instream flow (application), preserve, and riparian.
Total Rating		3.50	16.0	Greater than 11.0

G-2

From the analysis performed in Table 2, the total rating evaluated for Sonoita Creek is 16.0 which is greater than the cut-off number of 11.0. This indicates that Sonoita Creek is forwarded for Level 3 analysis.

The listing of watercourses classified under stream *Category A* and *Category C* for the second cut filter screening process are provided as follows:

3. Stream *Category A* – potentially susceptible to navigation.

    a. Cienega Creek
    b. Sonoita Creek

4. Stream Category C – navigation unlikely.

    a. Babocomari River – Santa Cruz
    b. O' Donnell Canyon
    c. Parker Canyon
    d. Sycamore Canyon – Santa Cruz
    e. Turkey Creek – Santa Cruz
    f. 1 unnamed wash

A summary listing of the RL2 data set is presented in Tables A-2A (see Appendix A). The map associated with the RL2 data set evaluated from Level 2 is shown in Figure 9.

The numerical weights assigned to the six criteria were based on the average values evaluated from the use of the criteria scoring matrix. This numerical weights are used as multipliers for the six criteria in calculating the total rating associated with each watercourse. The summary table listing the numerical weights assigned to the six criteria from a pool of seven participants is shown in Table B-1 (see Appendix B - Criteria Weight Evaluation).

TABLE A-1B
NRL1 Watercourses for Santa Cruz County

No. (1)	W_ID (2)	W_NAME (3)	SEGCOUNT (4)	W_COUNTIES (5)	W_MILES (6)	W_ADDRESS (7)	W_PER (8)	W_MBOAT (9)	W_HBOAT (10)	W_FISH (11)	W_SSTATUS (12)	W_DIMP (13)	HITS (14)
1	38546	Sonoita Creek	47	Santa Cruz	36.9206	,,SLG	Yes	No	No	Yes	Yes	Yes	4
2	108	Babocomari River - Santa Cruz	12	Santa Cruz	12.5730	,,SLG	Yes	No	No	Yes	Yes	No	3
3	470	Cienega Creek 1	50	Pima/Santa Cruz	45.2775	T17.0S,R17.0E,S01	Yes	No	No	Yes	Yes	No	3
4	36477	H82_0601	1	Santa Cruz	0.1130	T21.0S,R16.0E,S04	Yes	No	No	No	No	Yes	2
5	38107	O'Donnell Canyon	7	Santa Cruz	10.3189	T21.0S,R18.0E,S22	No	No	No	Yes	Yes	No	2
6	36134	Parker Canyon	1	Cochise/Santa Cruz	1.5568	T23.0S,R18.0E,S24	Yes	No	No	No	No	Yes	2
7	38647	Sycamore Canyon - Santa Cruz	11	Santa Cruz	9.8681	T23.0S,R11.0E,S80	Yes	No	No	No	Yes	No	2
8	38774	Turkey Creek - Cochise/Santa Cruz	8	Cochise/Santa Cruz	17.2469	,,SLG	Yes	No	No	Yes	No	No	2
9	41	Alum Gulch	4	Santa Cruz	5.7811	,,SLG	No	No	No	Yes	No	No	1
10	412	Cedar Creek 2	7	Pima/Santa Cruz	12.4395	T22.0S,R10.0E,S01	No	No	No	No	No	Yes	1
11	35996	H82_0013	4	Santa Cruz	0.7814	,,SLG	Yes	No	No	No	No	No	1
12	36135	H82_0234	2	Santa Cruz	4.1702	T23.0S,R18.0E,S26	No	No	No	No	No	Yes	1
13	36332	H82_0453	1	Santa Cruz	0.0966	T21.0S,R12.0E,S04	Yes	No	No	No	No	No	1
14	36364	H82_0485	4	Santa Cruz	3.1926	T23.0S,R13.0E,S18	No	No	No	No	No	Yes	1
15	38132	Oro Blanco Wash	8	Santa Cruz	7.0183	T22.0S,R10.0E,S24	No	No	No	No	No	Yes	1
16	36341	Peck Canyon Creek	7	Santa Cruz	10.0737	,,SLG	Yes	No	No	No	No	No	1
17	38269	Potrero Creek	9	Santa Cruz	12.7660	,,SLG	No	No	No	Yes	No	No	1
18	38329	Redrock Canyon	12	Santa Cruz	12.6608	T10.0S,R16.0E,S26	Yes	No	No	No	No	No	1

NOTES: The column headings are identified as follows:

W_ID: Unique ID number given to the watercourse.
W_NAME: Name of the watercourse.
SEGCOUNT: Number of segments merged together to comprise the watercouse.
W_COUNTIES: County(ies) where the watercourse is located.
W_MILES: Length of the watercourse in miles.
W_ADDRESS: Township, Range and Section of the mouth of the watercourse.
W_PER: Stream classification- perennial or not.
W_MBOAT: With modern boating or not.
W_HBOAT: With historical boating or not.
W_FISH: With fish or not.
W_DIMP: Impacted by dam or not.
W_SSTATUS: With special status designation or not.
HITS: Number of affirmative hits based on the six attribute data.

A-3

Table A-2C
L2 Watercourses in Santa Cruz County with Evaluated Ratings

No. (1)	W_ID (2)	W_NAME (3)	SEGCOUNT (4)	W_COUNTIES (5)	W_MILES (6)	PER_RAT (7)	HBOAT_RAT (8)	MBOAT_RAT (9)	DIMP_RAT (10)	FISH_RAT (11)	SS_RAT (12)	TOT_RAT (13)	REF_RAT (14)
1	38546	Sonoita Creek	47	Santa Cruz	36.92	1.0	0.0	0.0	1.0	1.00	0.500	3.50	16.00
2	470	Cienega Creek 1	50	Pima/Santa Cruz	45.28	1.0	0.0	0.0	0.0	0.75	0.940	2.69	11.88
3	108	Babocomari River - Santa Cruz	12	Santa Cruz	12.57	0.5	0.0	0.0	0.0	1.00	0.440	1.94	8.38
4	38107	O'Donnell Canyon	7	Santa Cruz	10.32	0.5	0.0	0.0	0.0	0.75	0.880	2.13	8.26
5	36134	Parker Canyon	1	Cochise/Santa Cruz	1.56	0.5	0.0	0.0	1.0	0.00	0.000	0.50	7.50
6	38647	Sycamore Canyon - Santa Cruz	11	Santa Cruz	9.87	1.0	0.0	0.0	0.0	0.00	0.000	1.00	7.00
7	412	Cedar Creek 2	7	Pima/Santa Cruz	12.44	0.0	0.0	0.0	1.0	0.00	0.000	1.00	4.00
8	38132	Oro Blanco Wash	8	Santa Cruz	7.02	0.0	0.0	0.0	1.0	0.00	0.000	1.00	4.00
9	35996	H82_0013	4	Santa Cruz	0.78	0.5	0.0	0.0	0.0	0.00	0.000	0.50	3.50
10	36332	H82_0453	1	Santa Cruz	0.10	0.5	0.0	0.0	0.0	0.00	0.000	0.50	3.50
11	36477	H82_0601	1	Santa Cruz	0.11	0.5	0.0	0.0	0.0	0.00	0.000	0.50	3.50
12	36341	Peck Canyon Creek	7	Santa Cruz	10.07	0.5	0.0	0.0	0.0	0.00	0.000	0.50	3.50
13	38329	Redrock Canyon	12	Santa Cruz	12.66	0.5	0.0	0.0	0.0	0.00	0.000	0.50	3.50
14	41	Alum Gulch	4	Santa Cruz	5.78	0.0	0.0	0.0	0.0	0.75	0.000	0.75	3.00
15	38269	Potrero Creek	9	Santa Cruz	12.77	0.0	0.0	0.0	0.0	0.75	0.000	0.75	3.00
16	38774	Turkey Creek - Cochise/Sta. Cruz	8	Cochise/Santa Cruz	17.25	0.0	0.0	0.0	0.0	0.75	0.000	0.75	3.00
17	36135	H82_0234	2	Santa Cruz	4.17	0.0	0.0	0.0	0.0	0.00	0.000	1.00	0.00
18	36364	H82_0485	4	Santa Cruz	3.19	0.0	0.0	0.0	0.0	0.00	0.000	1.00	0.00

NOTES: The column headings are identified as follows:

W_ID: Unique ID number given to the watercourse.
W_NAME: Name of the watercourse.
SEGCOUNT: Number of segments merged together to comprise the watercouse.
W_COUNTIES: County(ies) where the watercourse is located.
W_MILES: Length of the watercourse in miles.
PER_RAT: Perennial rating evaluated for the watercourse.
HBOAT_RAT: Historical boating rating evaluated for the watercourse.
MBOAT_RAT: Modern boating rating evaluated for the watercourse.
DIMP_RAT: Dam-impacted rating evaluated for the watercourse.
FISH_RAT: Fish rating evaluated for the watercourse.
SS_RAT: Special status evaluated rating for the watercourse.
TOT_RAT: Total rating evaluated for the watercourse which is the sum of the six ratings
REF_RAT: Refined total rating evaluated for the watercourse considering the numerical weights assigned to the six criteria.

SANTA CRUZ COUNTY

BEFORE THE
ARIZONA NAVIGABLE STREAM ADJUDICATION COMMISSION

IN THE MATTER OF THE NAVIGABILITY OF SMALL AND MINOR WATERCOURSES IN SANTA CRUZ COUNTY, ARIZONA, EXCLUDING THE SANTA CRUZ RIVER	No.: 03-001-NAV

REPORT, FINDINGS AND DETERMINATION REGARDING THE NAVIGABILITY OF SMALL AND MINOR WATERCOURSES IN SANTA CRUZ COUNTY, ARIZONA

Pursuant to Title 37, Chapter 7, Arizona Revised Statutes, the Arizona Navigable Stream Adjudication Commission ("Commission") has undertaken to receive, compile, review and consider relevant historical and scientific data and information, documents and other evidence regarding the issue of whether any small and minor watercourse in Santa Cruz, County, Arizona, excluding the Santa Cruz River, was navigable or nonnavigable for title purposes as of February 14, 1912. Proper and legal public notice was given in accordance with law and a hearing was held at which all parties were afforded the opportunity to present evidence, as well as their views, on this issue. The Commission having considered all of the historical and scientific data and information, documents and other evidence, including the oral and written presentations made by

persons appearing at the public hearing and being fully advised in the premises, hereby submits its report, findings and determination.

There are 524 documented small and minor watercourses in Santa Cruz County, of which 498 are unnamed. All of these watercourses, both named and unnamed, are the subject of and included in this report. Excluded from this report is the Santa Cruz River which is deemed to be a major watercourse and is the subject of a separate report. Included in this report are separate stream navigability studies for Cienega Creek and Sonoita Creek which were not rejected at level three of the small and minor watercourses study and for which it was felt more analysis and study was required. Attached hereto as Exhibit "A" is a list of all of the small and minor watercourses in Santa Cruz County, Arizona, both named and unnamed, covered by this report.

I. Procedure

On December 25, 2002, the Commission gave proper prior notice of its intent to study the issue of whether small and minor watercourses in Santa Cruz County, Arizona, were navigable or nonnavigable for title purposes as of February 14, 1912, in accordance with A.R.S. § 37-1123B. A copy of the Notice of Intent to Study and Receive, Review and Consider Evidence on the issue of navigability of small and minor watercourses in Santa Cruz County is attached hereto as Exhibit "B."

After collecting and documenting all reasonably available evidence received pursuant to the Notice of Intent to Study and to Receive, Review and Consider

Evidence, the Commission scheduled a public hearing to receive additional evidence and testimony regarding the navigability or nonnavigability of small and minor watercourses located in Santa Cruz County, Arizona. Public notice of this hearing was given by legal advertising on January 28, 2003, as required by law pursuant to A.R.S. § 37-1126 and, in addition, by mail to all those requesting individual notice and by means of the ANSAC website (azstreambeds.com). This hearing was held on March 11, 2003, in the City of Nogales, the county seat of Santa Cruz County, since the law requires that such hearing be held in the county in which the watercourses being studied are located. Attached hereto as Exhibit "C" is a copy of the notice of the public hearing.

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 nonnavigability, 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.

Following the public hearing held on March 11, 2003, all parties were advised that they could file post-hearing memoranda pursuant to Rule R12-17-108.01. A post-hearing memorandum was filed by Salt River Project Agriculture and

Improvement District and the Salt River Valley Water Users Association. On September 23, 2003, at a public hearing in Phoenix, Arizona, after considering all of the evidence and testimony submitted, and the post-hearing memorandum 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 all small and minor watercourses in Santa Cruz County, Arizona, were nonnavigable as of February 14, 1912.

II. Santa Cruz County, Arizona

Santa Cruz County, Arizona, is located in the south central portion of the state and is approximately 1,235 square miles in land area, with a population of 40,075 as of July 1, 2000. It borders Pima County to the north and west, Santa Cruz County to the east, and the State of Sonora, Mexico to the south. Santa Cruz County lies within the following latitude and longitude ranges: 31° 20' 00" North to 31° 44' 00" North and 110° 25' 00" West to 111° 22' 00" West.

Santa Cruz County lies in the basin and range area of southeastern Arizona. There are plains and valleys of semi-arid desert and rolling hills of grassland, but arising from them are mountains, sometimes called island mountains, containing pine trees and other mountain foliage. The highest point in the county is Mt. Wrightson located in the Coronado National Forest at 9,453 feet above sea level. The lowest point in the county is at Patagonia Lake at 3,325 feet above sea level. Santa Cruz County is

the smallest county in the State, and its geography consists of mountain ranges on each side of the county, with valleys and plains in between. The Huachuca Mountains and Patagonia Mountains are located on the east side of the county. There are a number of old mining towns ("ghost towns") in these mountains where mines were formerly located. To the west and north of the Patagonia Mountains are valleys with rolling hills where the Cienega and Sonoita Creeks flow. The Santa Rita Mountains are located in the north central portion of the county, and the Huachuca Mountains are in the southeastern portion. Mountains of the Coronado National Forest also lie in the western part of the county. Between these mountains and the Santa Rita and Patagonia Mountains lies the Santa Cruz River valley.

The major population of center of Santa Cruz County is the city of Nogales, which is also the county seat. Smaller towns or settlements located in Santa Cruz County are Amado, Tubac, Rio Rico, Patagonia, Sonoita, and Elgin. As noted above, there are a number of ghost towns in the mountains which were the sites of settlements that served the mines when they were active. The major commercial industry of Santa Cruz County is tourism and commerce in connection with the border crossing at Nogales. There is also substantial ranching in the county and some farming along the Santa Cruz River. Interstate 19 is the main north-south corridor of transportation, running north from Nogales to Tucson. State Highway 82 also runs in a northeasterly direction from Nogales through Patagonia and Sonoita. A branch line of the Union

Pacific/Southern Pacific Railroad runs generally parallel to Interstate 19 from Tucson to Nogales and on south into Mexico. Major areas of interest in Santa Cruz County are Nogales and the border crossing into Mexico, Tumacacori National Monument, Tubac Presidio State Historical Park, Patagonia Lake State Park, Pena Blanca Lake, and the Smithsonian Astrophysical Observatory located above Madera Canyon in the Santa Rita Mountains.

III. Background and Historical Perspectives

A. Public Trust Doctrine and Equal Footing Doctrine

The reason for the legislative mandated study of navigability of watercourses within the state is to determine who holds title to the beds and banks of such rivers and watercourses. Under the public trust doctrine, as developed by common law over many years, the tidal lands and beds of navigable rivers and watercourses, as well as the banks up to the high water mark, are held by the sovereign in a special title for the benefit of all the people. In quoting the U.S. Supreme Court, the Arizona Court of Appeals described the public trust doctrine in its decision in *The Center for Law v. Hassell,* 172 Ariz. 356, 837 P.2d 158 (App.1991), review denied October 6, 1992.

> An ancient doctrine of common law restricts the sovereign's ability to dispose of resources held in public trust. This doctrine, integral to watercourse sovereignty, was explained by the Supreme Court in *Illinois Cent. R.R. v. Illinois,* 146 U.S. 387, 13 S.Ct. 110, 36 L.Ed. 1018 (1892). A state's title to lands under navigable waters
>
> > is a title different in character from that which the State holds in lands intended for sale. . . . It is a title held in trust

> for the people of the State that they may enjoy the navigation of the waters, carry on commerce over them, and have liberty of fishing therein freed from the obstruction or interference of private parties.
>
> *Id.* at 452, 13 S.Ct. at 118; *see also Martin v. Waddell*, 41 U.S. (16 Pet.) at 413 (describing watercourse sovereignty as "a public trust for the benefit of the whole community, to be freely used by all for navigation and fishery, as well for shellfish as floating fish").

Id., 172 Ariz. at 364, 837 P.2d at 166.

This doctrine is quite ancient and was first formally codified in the Code of the Roman Emperor Justinian between 529 and 534 A.D.[1] The provisions of this Code, however, were based, often verbatim, upon much earlier institutes and journals of Roman and Greek law. Some historians believe that the doctrine has even earlier progenitors in the rules of travel on rivers and waterways in ancient Egypt and Mesopotamia. This rule evolved through common law in England which established that the king as sovereign owned the beds of commercially navigable waterways in order to protect their accessibility for commerce, fishing and navigation for his subjects. In England the beds of nonnavigable waterways where transportation for commerce was not an issue were owned by the adjacent landowners.

This principle was well established by English common law long before the American Revolution and was a part of the law of the American colonies at the time of the Revolution. Following the American Revolution, the rights, duties and

[1] *Putting the Public Trust Doctrine to Work*, David C. Slade, Esq. (Nov. 1990), pp. xvii and 4.

responsibilities of the crown passed to the thirteen new independent states, thus making them the owners of the beds of commercially navigable streams, lakes and other waterways within their boundaries by virtue of their newly established sovereignty. The ownership of trust lands by the thirteen original states was never ceded to the federal government. However, in exchange for the national government's agreeing to pay the debts of the thirteen original states incurred in financing the Revolutionary War, the states ceded to the national government their undeveloped western lands. In the Northwest Ordinance of 1787, adopted just prior to the ratification of the U. S. Constitution and subsequently re-enacted by Congress on August 7, 1789, it was provided that new states could be carved out of this western territory and allowed to join the Union and that they "shall be admitted . . . on an equal footing with the original states, in all respects whatsoever." (Ordinance of 1787: The Northwest Territorial Government, § 14, Art. V, 1 stat. 50. See also U. S. Constitution, Art. IV, Section 3). This has been interpreted by the courts to mean that on admission to the Union, the sovereign power of ownership of the beds of navigable streams passes from the federal government to the new state. *Pollard's Lessee v. Hagan, et al.*, 44 U.S. (3 How.) 212 (1845), and *Utah Division of State Lands v. United States*, 482 U.S. 193 (1987).

In discussing the equal footing doctrine as it applies to the State's claim to title of beds and banks of navigable streams, the Court of Appeals stated in *Hassell*:

> The state's claims originated in a common-law doctrine, dating back at least as far as Magna Charta, vesting title in the sovereign to lands affected by the ebb and flow of tides. See *Martin v. Waddell*, 41 U.S. (16 Pet.) 367, 412-13, 10 L.Ed. 997 (1842). The sovereign did not hold these lands for private usage, but as a "high prerogative trust . . . , a public trust for the benefit of the whole community." *Id.* at 413. In the American Revolution, "when the people . . . took into their own hands the powers of sovereignty, the prerogatives and regalities which before belong either to the crown or the Parliament, became immediately and rightfully vested in the state." *Id.* at 416.
>
> Although watercourse sovereignty ran with the tidewaters in England, an island country, in America the doctrine was extended to navigate inland watercourses as well. See *Barney v. Keokuk*, 94 U.S. 324, 24 L.Ed. 224 (1877); *Illinois Cent. R.R. v. Illinois*, 146 U.S. 387, 434, 13 S.Ct. 110, 111, 36 L.Ed. 1018 (1892). Moreover, by the "equal footing" doctrine, announced in *Pollard's Lessee v. Hagan*, 44 U.S. (3 How.) 212, 11 L.Ed. 565 (1845), the Supreme Court attributed watercourse sovereignty to future, as well as then-existent, states. The Court reasoned that the United States government held lands under territorial navigable waters in trust for future states, which would accede to sovereignty on an "equal footing" with established states upon admission to the Union. *Id.* at 222-23, 229; *accord Montana v. United States*, 450 U.S. 544, 101 S.Ct. 1245, 67 L.Ed.2d 493 (1981); *Land Department v. O'Toole*, 154 Ariz. 43, 44, 739 P.2d 1360, 1361 (App. 1987).
>
> The Supreme Court has grounded the states' watercourse sovereignty in the Constitution, observing that "[t]he shores of navigable waters, and the soils under them, were not granted by the Constitution to the United States, but were reserved to the states respectively." *Pollard's Lessee*, 44 U.S. (3 How.) at 230; see also *Oregon ex rel. State Land Board v. Corvallis Sand & Gravel Co.*, 429 U.S. 363, 374, 97 S.Ct. 582, 589, 50 L.Ed.2d 550 (1977) (states' "title to lands underlying navigable waters within [their] boundaries is conferred . . . by the [United States] constitution itself").

Id., 172 Ariz. 359-60, 837 P.2d at 161-162.

In the case of Arizona, the "equal footing" doctrine means that if any stream or watercourse within the State of Arizona was navigable on February 14, 1912, the date

Arizona was admitted to the Union, the title to its bed is held by the State of Arizona in a special title under the public trust doctrine. If the stream was not navigable on that date, ownership of the streambed remained in such ownership as it was prior to statehood--the United States if federal land, or some private party if it had previously been patented or disposed of by the federal government--and could later be sold or disposed of in the manner of other land since it had not been in a special or trust title under the public trust doctrine. Thus, in order to determine title to the beds of rivers, streams, and other watercourses within the State of Arizona, it must be determined whether or not they were navigable or nonnavigable as of the date of statehood.

B. Legal Precedent to Current State Statutes

Until 1985, most Arizona residents assumed that all rivers and watercourses in Arizona, except for the Colorado River, were nonnavigable and accordingly there was no problem with the title to the beds and banks of any rivers, streams or other watercourses. However, in 1985 Arizona officials upset this long-standing assumption and took action to claim title to the bed of the Verde River. *Land Department v. O'Toole,* 154 Ariz. 43, 739 P.2d 1360 (App. 1987). Subsequently, various State officials alleged that the State might hold title to certain lands in or near other watercourses as well. *Id.*, 154 Ariz. at 44, 739 P.2d at 1361. In order to resolve the title questions to the beds of Arizona rivers and streams, the Legislature enacted a law in 1987 substantially

relinquishing the state's interest in any such lands.[2] With regard to the Gila, Verde and Salt Rivers, this statute provided that any record title holder of lands in or near the beds of those rivers could obtain a quitclaim deed from the State Land Commissioner for all of the interest the sate might have in such lands by the payment of a quitclaim fee of $25.00 per acre. The Arizona Center for Law in the Public Interest filed suit against Milo J. Hassell in his capacity as State Land Commissioner, claiming that the statute was unconstitutional under the public trust doctrine and gift clause of the Arizona Constitution as no determination had been made of what interest the state had in such lands and what was the reasonable value thereof so that it could be determined that the state was getting full value for the interests it was conveying. The Superior Court entered judgment in favor of the defendants and an appeal was taken. In its decision in *Hassell,* the Court of Appeals held that this statute violated the public trust doctrine and the Arizona Constitution and further set forth guidelines under which the state could set up a procedure for determining the navigability of rivers and watercourses in Arizona. In response to this decision, the Legislature established the Arizona Navigable Stream Adjudication Commission and enacted the statutes pertaining to its operation. 1992 Arizona Session Laws, Chapter 297 (1992 Act). The charge given to the Commission by the 1992 Act was to conduct full evidentiary public hearings across the

[2] Prior to the enactment of the 1987 statute, the Legislature made an attempt to pass such a law, but the same was vetoed by the Governor. The 1987 enactment was signed by the Governor and became law. 1987 Arizona Sessions Law, Chapter 127.

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 37-1128.

The 1992 Act provided that the Commission would make findings of navigability or nonnavigability for each watercourse. See former A.R.S. § 37-1128(A). Those findings were based upon the "federal test" of navigability in former 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), 37-1128(A).

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 Arizona Session Laws, ch. 178 ("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. The 1994 Act also established certain presumptions of nonnavigability and exclusions of some types of evidence.

Based upon the 1994 Act, the Commission went forth 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 Arizona State Land Department 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. 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. The Court of Appeals struck down that legislation in its *Hull* decision, finding that the Legislature had not applied the proper standards of navigability. *Id.* 199 Ariz. at 427-28, 18 P.3d at 738-39.

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 Arizona Session Laws, ch. 166, § 1. The 2001 legislation now governs the Commission in making its findings with respect to the small and minor watercourses in Santa Cruz County.

IV. Issues Presented

The applicable Arizona statutes state that the Commission has jurisdiction to determine which, if any, Arizona watercourses were "navigable" on February 14, 1912 and for any watercourses determined to be navigable, to identify the public trust values. A.R.S. § 37-1123. A.R.S. § 37-1123A provides as follows:

> A. The commission shall receive, review and consider all relevant historical and other evidence presented to the commission by the state land department and by other persons regarding the navigability or nonnavigability of watercourses in this state as of February 14, 1912, together with associated public trust values, except for evidence with

respect to the Colorado River and, after public hearings conducted pursuant to section 37-1126:

1. Based only on evidence of navigability or nonnavigability, determine what watercourses were not navigable as of February 14, 1912.

2. Based only on evidence of navigability or nonnavigability, determine whether watercourses were navigable as of February 14, 1912.

3. In a separate, subsequent proceeding pursuant to section 37-1128, subsection B, consider evidence of public trust values and then identify and make a public report of any public trust values that are now associated with the navigable watercourses.

A.R.S. §§ 37-1128A and B provide as follows:

A. 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 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.

B. With respect to those watercourses that the commission determines were navigable, the commission shall, in a separate, subsequent proceeding, identify and make a pubic report of any public trust values associated with the navigable watercourse.

Thus, in compliance with the statutes, the Commission is required to collect evidence, hold hearings, and determine which watercourses in existence on February 14, 1912, were navigable or nonnavigable. This report pertains to all of the small and minor watercourses in Santa Cruz County, Arizona, and excludes the Santa Cruz River. In the hearings to which this report pertains, the Commission considered

all of the available historical and scientific data and information, documents and other evidence relating to the issue of navigability of the small and minor watercourses in Santa Cruz County, Arizona, as of February 14, 1912.

Public trust values were not considered in these hearings but will be considered in separate, subsequent proceedings, if required. A.R.S. §§ 37-1123A3 and 37-1128B. In discussing the use of an administrative body such as the Commission on issues of navigability and public trust values, the Arizona Court of Appeals in its decision in *Hassell* found that the State must undertake a "particularized assessment" of its "public trust" claims but expressly recognized that such assessment need not take place in a "full blown judicial" proceeding.

> We do not suggest that a full-blown judicial determination of historical navigability and present value must precede the relinquishment of any state claims 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, however, we cannot find that the gift clause requirement of equitable and reasonable consideration has been met.

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

The 2001 *Hull* court, although finding certain defects in specific aspects of the statute then applicable, expressly recognized that a determination of "navigability" was essential to the State having any "public trust" ownership claims to lands in the bed of a particular watercourse:

> The concept of navigability is "essentially intertwined" with public trust discussions and "[t]he navigability question often resolves whether any public trust interest exists in the resource at all." Tracy Dickman Zobenica, *The Public Trust Doctrine in Arizona's Streambeds*, 38 Ariz.L.Rev. 1053, 1058 (1996). In practical terms, this means that **before a state has a recognized public trust interest in its watercourse bedlands, it first must be determined whether the land was acquired through the equal footing doctrine. However, for bedlands to pass to a state on equal footing grounds, the watercourse overlying the land must have been "navigable" on the day that the state entered the union.**

199 Ariz. at 418, 18 P.3d at 729 (also citing *O'Toole*, 154 Ariz. at 45, 739 P.2d at 1362 (emphasis added).

The Legislature and the Court of Appeals in *Hull* have recognized that, unless the watercourse was "navigable" at statehood, the State has no "public trust" ownership claim to lands along that watercourse. Using the language of *Hassell*, if the watercourse was not "navigable," the "validity of the equal footing claims that [the State] relinquishes" is **zero**. *Hassell*, 172 Ariz. at 371, 837 P.2d at 173. Thus, if there is no claim to relinquish, there is no reason to waste public resources determining (1) the value of any lands the State **might** own **if** it had a claim to ownership, (2) "equitable and reasonable considerations" relating to claims it might relinquish without compromising the "public trust," or (3) any conditions the State might want to impose on transfers of its ownership interest. See *id.*

V. Burden of Proof

The Commission in making its findings and determinations utilized the standard of the preponderance of the evidence as the burden of proof as to whether or not a stream was navigable or nonnavigable. A.R.S. § 37-1128A provides as follows:

> 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.

This statute is consistent with the decision of the Arizona courts that have considered the matter. *Hull,* 199 Ariz. at 420, 18 P.3d at 731 ("... a 'preponderance' of the evidence appears to be the standard used by the courts. See, *e.g., North Dakota v. United States,* 972 F.2d 235-38 (8th Cir. 1992)"); *Hassell,* 172 Ariz. at 363, n. 10, 837 P.2d at 165, n. 10 (The question of whether a watercourse is navigable is one of fact. The burden of proof rests on the party asserting navigability . . . ."); *O'Toole,* 154 Ariz. at 46, n. 2, 739 P.2d at 1363, n. 2.

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 overbears, in some degree, the weight upon the other side.

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

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 U.S. 388, 403-06 (E.D. N.Y. 1978), *aff'd* 603 F.2d 1053 (2nd Cir. 1979), *cert. denied* 444 U.S. 1073 (1980); *United States v. Schipani*, 289 F.Supp. 43, 56 (E.D. N.Y. 1968), aff'd, 414 F.2d 1262 (2nd Cir. 1969).

VI. Standard for Determining Navigability

The statute defines a navigable watercourse as follows:

> "Navigable" or "navigable watercourse" means 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.

A.R.S. § 37-1101(5).

The foregoing statutory definition is taken almost verbatim from the U. S. Supreme Court decision in *The Daniel Ball*, 77 U.S. (10 Wall) 557, 19 L.Ed. 999 (1870), which is considered by most authorities as the best statement of navigability for title purposes. In its decision, the Supreme Court stated:

> 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 and travel are or may be conducted in the customary modes of trade and travel on water.

77 U.S. at 563.

In a later opinion in *U. S. v. Holt Bank*, 270 U.S. 46 (1926), the Supreme Court stated:

> [Waters] which are navigable in fact must be regarded as navigable in law; that they are navigable in fact when they are used, or are susceptible of being used, in their natural and 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; and further that navigability does not depend on the particular mode in which such use is or may be had—whether by steamboats, sailing vessels or flatboats—nor on an absence of occasional difficulties in navigation, but on the fact, if it be a fact, that the [water] in its natural and ordinary condition affords a channel for useful commerce.

270 U.S. at 55-56.

The Commission also considered the following definitions contained in A.R.S. § 37-1101 to assist it in determining whether small and minor watercourses in Santa Cruz County were navigable at statehood.

> 11. "Watercourse" means the main body or a portion or reach of any lake, river, creek, stream, wash, arroyo, channel or other body of water. Watercourse does not include a man-made water conveyance system described in paragraph 4 of this section, except to the extent that the system encompasses lands that were part of a natural watercourse as of February 14, 1912.
>
> 3. "Highway for commerce" means a corridor or conduit within which the exchange of goods, commodities or property or the transportation of persons may be conducted.
>
> 2. "Bed" means the land lying between the ordinary high watermarks of a watercourse.
>
> 6. "Ordinary high watermark" means the line on the banks of a watercourse established by fluctuations of water and indicated by physical characteristics, such as a clear natural line impressed on the bank, shelving, changes in the character of the soil, destruction of terrestrial vegetation or the presence of litter and debris, or by other appropriate means that consider the characteristics of the surrounding areas. Ordinary high watermark does not mean the line reached by unusual floods.
>
> 8. "Public trust land" means the portion of the bed of a watercourse that is located in this state and that is determined to have been a navigable watercourse as of February 14, 1912. Public trust land does not include land held by this state pursuant to any other trust.

Thus, the State of Arizona in its current statutes follows the federal test for determining navigability.

VII. Evidence Received and Considered by the Commission

Pursuant to A.R.S. § 37-1123, and other provisions of Title 37, Chapter 7, Arizona Revised Statutes, the Commission received, compiled, and reviewed evidence and records regarding the navigability and nonnavigability of small and minor watercourses located in Santa Cruz County, Arizona. Evidence consisting of studies, written documents, newspapers and other historical accounts, pictures and testimony were submitted. A comprehensive study entitled "Final Report - Small & Minor Watercourses Analysis for Santa Cruz County, Arizona" prepared by Stantec Consulting Inc., in association with JE Fuller/Hydrology & Geomorphology, Inc., under supervision of the Arizona State Land Department, dated August 1, 2000, was submitted. An earlier draft of the final report, dated June 9, 2000, was also considered by the Commission. The Commission also considered documents, studies, and reports submitted by the Arizona Center for Law in the Public Interest, the Central Arizona Paddlers Club (Dorothy Riddle), Arizona Audubon Council, Friends of Arizona Rivers, Rio Rico Properties, Inc., and several individuals including Richard Lee Duncan, Mark Larkin, James T. Braselton, and Leonard C. Halpenny, most of which were submitted primarily in conjunction with the study of the Santa Cruz River. The Arizona Center for Law in the Public Interest submitted a comprehensive brief pertaining to the Santa Cruz River and other rivers in the State. Mr. Leonard C. Halpenny submitted a comprehensive review of the hydrology of the Santa Cruz basin in the vicinity of the

Santa Cruz-Pima County line prepared by Water Development Corporation Consultants on Water Resources, and further submitted a paper presented to the First Annual Conference of the Arizona Hydrological Society on September 16, 1988, regarding the hydrology of the Santa Cruz basin. The list of evidence and records, together with a summarization is attached as Exhibit "D." The Commission also heard testimony and received and considered evidence at the public hearing on small and minor watercourses located in Santa Cruz County, Arizona, held in Nogales, Arizona, on March 11, 2003. The minutes of the hearing are attached hereto as Exhibit "E".

A. Small & Minor Watercourses Analysis for Santa Cruz County, Arizona

1. Analysis Methods.

Due to the number of small and minor watercourses located in Santa Cruz County, Arizona (524 watercourses, of which 498 are unnamed), it is impractical and unnecessary to consider each watercourse with the same detail that the Commission considered major watercourses. The study of small and minor watercourses developed by Stantec Consulting Inc. and its associates provided for an evaluation using a three-level process which contained criteria that would be necessarily present for a stream to be considered navigable. A master database listing all small and minor watercourses was developed from the Arizona Land Resource Information System (ALRIS) with input from the U. S. Geological Survey, the U. S. Environmental Protection Agency and other agencies and sources. The final version of the master

database called "Streams" includes a hydrological unit code (HUC), segment number, mileage, watercourse type and watercourse name, if available. Thus there is a hydrological unit code for each of the segments of the 524 small and minor watercourses in Santa Cruz County, Arizona. In addition, the database locates each segment by section, township, and range. Some of the satellite databases discussed below also locate certain significant reference points by latitude and longitude.

Using the master database, the contractor also set up six satellite databases, each relating to a specific stream characteristic or criterion, that would normally be found in a watercourse considered to be navigable or susceptible of navigability. These stream criteria are as follows:

1. Perennial stream flow;
2. Dam located on stream;
3. Fish found in stream;
4. Historical record of boating;
5. Record of modern boating; and
6. Special status (other water related characteristics, including in-stream flow application and/or permit, unique waters, wild and scenic, riparian, and preserve).

All watercourses were evaluated at level one which is a binary (yes or no) sorting process as to whether or not these characteristics are present. For a stream or watercourse not to be rejected at level one, it must be shown that at least one of these

characteristics is present. If none of these characteristics are present, the stream or watercourse is determined to require no further study and is rejected at level one as having no characteristics of navigability.

All streams and watercourses surviving the level one sorting (i.e., determined to have one or more of the above characteristics) are evaluated at level two. The level two analysis is more qualitative than level one and its assessment requires a more in-depth analysis to verify and interpret the reasons that caused a particular stream to advance from level one. Each of the above characteristics on which there was an affirmative answer at level one is analyzed individually at level two to determine whether the stream is potentially susceptible to navigation or not susceptible to navigation; for example, a watercourse that at first appears to be perennial in flow but upon further analysis is determined to have only a small flow from a spring for a short distance and therefore cannot be considered perennial for any substantial portion of the watercourse.

In addition, the level two analysis utilized a refinement with value engineering techniques analyzing watercourses with more than one affirmative response at level one and assigned values to each of the six categories mentioned above. Clearly, perennial flow, historical boating, and modern boating are more important to the issue of navigability than the categories of dam impacted, special status, or fish. Thus, for the purpose of the value engineering study, the following rough values were assigned to each of the six categories: historical boating-10, modern boating-8, perennial stream-7,

dam impacted-4, fish-4, and special status-2. This system is a recognized tool used in value engineering studies, and seven qualified engineers from the state Land Department and consulting staff of the contractor participated in determining the values used for each category. This system establishes that a value in excess of 13 is required for a stream to survive the level two evaluation and pass to level three for consideration. Thus, a stream having both perennial flow and historical boating (sum value of 17), or a combination of the values set for other criteria equaling more than 13, would require that the stream pass to evaluation at level three. If a stream does not have a sum value greater than 13, it is determined to require no further study and is rejected at level two as having insufficient characteristics of navigability.

If a stream survives the evaluation at level two, it goes on to level three which uses quantitative hydrologic and hydraulic analysis procedures including any stream gauge data available, as well as engineering estimates of depth, width and velocity of any water flow in the subject watercourse and comparing the same to minimum standards required for different types of vessels. Also considered is the configuration of the channel and whether it contains rapids, boulders or other obstacles. If a stream or watercourse is not rejected or eliminated at level three, it is removed from this process and subjected to a separate detailed study similar to that performed on a major watercourse, and a separate report will be issued on that stream or watercourse. Since

two streams survived the level three analysis, a separate detailed stream navigability study was performed on each of them and separate reports are included herein.

2. Application of Analysis Methods to Small and Minor Watercourses in Santa Cruz County.

The application of the level one analysis to the 524 small and minor watercourses located in Santa Cruz County resulted in 506 watercourses or 96.6% being determined as not having any of the six characteristics listed above, and these 506 were therefore rejected or eliminated and did not proceed to a further evaluation at level two. Attached as Exhibit "F" is a list of the watercourses in Santa Cruz County which were determined to have no characteristics of navigability or characteristics indicating susceptibility of navigability at level one.

Only 18 watercourses, approximately 3.4%, received an affirmative response to one or more of the above characteristics or criteria and were evaluated at level two. Ten of these watercourses had only one affirmative response at level one and, after further analysis of that affirmative response, were rejected and determined not to have the characteristics of navigability requiring further study. Eight of the watercourses received an affirmative response to more than one of the characteristics listed. In the value engineering analysis, it was determined that of these eight streams with more than one affirmative response at level one, only two streams had a sum value of more than 13 when analyzed pursuant to the value engineering techniques and therefore

should be advanced for further study at level three. It was determined that 16 of the streams analyzed at level two could not be considered as susceptible of navigability and were therefore rejected at level two. Attached as Exhibit "G" is a list of the 18 watercourses that received a positive response to one or more of the characteristics listed above and were evaluated at level two. The two streams that survived the value engineering analysis at level two and were considered at level three are Cienega Creek and Sonoita Creek.

3. Level Three Analysis of Cienega Creek

Cienega Creek is located in the northeastern portion of Santa Cruz County and the southeastern portion of Pima County. It received three affirmative responses in the level one analysis, including perennial stream flow, fish in stream and special status.

Cienega Creek originates in the Canelo Hills in Santa Cruz County and flows north, crossing the county line into Pima County to a point near Vail, Arizona, where the stream changes its name to Pantano Wash. It is 31.2 miles in length and has a drainage area or watershed of 457 square miles. The watershed is bounded by the Rincon Mountains to the north, the Whetstone Mountains to the east, the Canelo Hills to the south, and the Santa Rita Mountains to the west. Elevations within the watershed range from 9,400 feet at Mt. Wrightson in the Santa Rita Mountains to 3,200 feet at the Colossal Cave Road crossing. Vegetation in the watershed includes ponderosa pine in the upper elevations of the Santa Rita Mountains and oak, juniper, agave, and extensive

grasslands in the lower elevations. The bed of the creek consists of a sand and gravel bedded channel and low banks lined with riparian vegetation or grassland. The main channel of Cienega Creek is straight to slightly sinuous and consists of single and braided channel reaches. Downstream or to the north of Interstate 10 Cienega Creek flows within a well-defined canyon, while upstream or south of Interstate 10 the stream is shallower with less well-defined transition to the surrounding grasslands. Historical data indicates that Cienega Creek experienced arroyo cutting during the late 1800's and early 1900's when the area was overgrazed. Arroyo cutting appears to be continuing today in the upper reaches of Cienega Creek in Santa Cruz County.

U. S. Geological Survey stream gauges provide a historical record of stream flow at two sites on Cienega Creek. The stream gauge data indicates that Cienega Creek is a perennial stream at Vail and that its highest seasonal flow occurs during the summer monsoon months of July through September. The average annual flow is approximately 6.2 cfs, with a flow depth of two-tenths to one-half of a foot and a stream width of six to twenty feet. During unusual periods of high precipitation and flooding, the stream flow is much higher and has recently run as high as 2,600 cfs. Comparing the stream flow data with boating criteria, it would appear that the stream could be boated by low draft canoes or kayaks approximately 10% of the time and perhaps more during unpredictable high flows. Boating by larger commercial craft would be highly unlikely. Other than a small dam upstream from Vail, there are no obstacles in the

creek that would inhibit boating. There is no history of boating on this stream and no history of commercial fishing. Due to the configuration of the stream and the concerns expressed by numerous private and public landowners and land managers along Cienega Creek, the contractors have recommended a more in-depth study of the potential or susceptibility of navigability of Cienega Creek and, accordingly, this watercourse was not rejected at level three and a separate detailed study was conducted.

4. Level Three Analysis of Sonoita Creek

Sonoita Creek is located in the center of Santa Cruz County commencing in the northeast part of the county and flowing in a southwesterly direction. Sonoita Creek received four affirmative responses at the level one analysis, including perennial stream, fish, special status, and a dam.

Sonoita Creek has its headwaters near the town of Sonoita and flows in a southwesterly direction to its confluence with the Santa Cruz River near Rio Rico. It is 21.7 miles in length and its total drainage area is 265 square miles. The watershed is bounded by the Santa Rita Mountains to the north, Canelo Hills to the east, Patagonia Mountains to the south, and the Santa Cruz River valley to the west. The altitude of the watershed ranges from over 9,400 feet at Mt. Wrightson in the Santa Rita Mountains to 3,400 feet at Rio Rico where the creek runs in to the Santa Cruz River. Vegetation ranges from oak, woodlands, and ponderosa pine in the upper elevations of the Santa

Rita Mountains to upland desert scrub in the lower elevations. Vegetation along Sonoita Creek includes cottonwood, willow, riparian forests, and grassland, dry-wash species such as palo verde and mesquite. The main valley of Sonoita Creek ranges from ten to twenty miles wide and is cut by an inner valley less than a half mile wide to a depth of approximately 100 feet. The main channel of Sonoita Creek is a dry sand bed, approximately ten to twenty feet wide at most places.

A U.S. Geological Survey stream flow station is located near Patagonia. A dam on the creek below Patagonia creates Patagonia Lake which is utilized for fishing, boating and other recreational activities. The Geological Survey gauge station indicates that the stream is perennial during most of the year, although it can dry up completely during the driest seasons of the year. The highest average flows occur during the summer monsoon months of July, August and September. The gauge station indicates an average annual flow of 8.1 cfs and a flow depth of .02 to .04 of a foot and a flow width of ten to twenty feet. Downstream from the dam at Patagonia Lake, regulated releases average approximately 3.3 cfs. Storage behind the dam effectively moderates the natural flow rate, eliminating small flood peaks and seasonal high flows.

There are no modern or historical accounts of any type of boating on Sonoita Creek except at Patagonia Lake. However, the analysis discloses that the stream could be boated by low-draft canoes and kayaks less than 10% of the time, but boating by larger commercial craft would be highly unlikely. Due to concerns regarding the

historical record with respect to navigability and to address potential concerns of numerous public and private landowners and land managers along Sonoita Creek, a more in-depth study was recommended and, accordingly, this watercourse was not rejected at level three and a separate detailed study was conducted.

5. Summary of Results of Small and Minor Watercourses Analysis for Santa Cruz County, Arizona

All of the 524 small and minor watercourses in Santa Cruz County were analyzed in the three-level process developed by the State Land Department and its contractors Stantec and J.E. Fuller Hydrology. At level one, 506 watercourses or 96.6% were determined as not having an affirmative response to any of the six characteristics utilized at level one and were therefore rejected and eliminated at level one. Eighteen watercourses, approximately 3.4%, received an affirmative response to one or more of the characteristics or criteria and were evaluated at level two. Ten of these watercourses received only one affirmative response at level one, and further analysis disclosed that they should be rejected as not having the characteristics of navigability requiring further study. Eight of the watercourses received more than one affirmative response at level one and were analyzed under the value engineering system described above. In this analysis six of the watercourses had a sum value of less than 13 and were determined as not having the characteristics of navigability requiring further study. Only two streams had a sum value of more than 13 and were determined to require

further study at level three. These two streams, Cienega Creek and Sonoita Creek, were evaluated at level three and, due to the configuration of the streams and concerns expressed by numerous private and public landowners and land managers along these streams, the contractors have recommended a more in-depth study of the potential or susceptibility of navigability of these creeks. Accordingly they were not rejected at level three, and separate detailed studies of Cienega Creek and Sonoita Creek were conducted.

The testimony and statements of individuals who appeared at the hearing and the submitted written material expressing their views agreed with the results of the small and minor watercourse analysis set forth in this section and bore out the conclusion of the Commission that the small and minor watercourses in Santa Cruz County, including Cienega Creek and Sonoita Creek. were not navigable or susceptible of navigability as of the date Arizona became a state.

B. Prehistoric and Historic Considerations Affecting Small and Minor Watercourses in Santa Cruz County, Arizona

In addition to the Small and Minor Watercourses Analysis and other evidence described above, the Commission also considered evidence of the prehistoric conditions and the historic development of Santa Cruz County as disclosed in part in the study submitted in connection with hearings on navigability of the Santa Cruz River.

1. Prehistory or Pre-Columbian Conditions

The paleoindian tradition and early stages of the subsequent cultural tradition, the archaic period, are not as well represented along the Santa Cruz River as they are along the San Pedro River. Some clovis points have been found in excavations along the Santa Cruz River, but the situation along the Santa Cruz contrasts sharply with the San Pedro River valley where varied clovis kill sites have yielded evidence that continues to be remarkable in the context of new world prehistory. Since the weather and climate is very similar, the lack of paleoindian sites in the Santa Cruz River valley is probably due to the fact that they have not been discovered or, if they were present, have been destroyed by erosion or covered over by flood deposits.

The archaic period, sometimes known as the Cochise culture, is better represented by known sites in the Santa Cruz River valley and the hills and mountains on each side of the valley. These sites are mostly occasional camps indicating that the primary activity was to gather and prepare food. Some structures such as temporary brush shelters have been found. As is well documented in other sites in southern Arizona, the Archaic culture developed into the Hohokam culture some time between 300 A.D. and 300 B.C. Excavations in the Tucson basin area have lent support to the theory that the Hohokam culture developed, at least in this area, out of the Archaic tradition. Others maintain that the Hohokam culture was greatly influenced by

immigration from meso-america. In the Tucson basin and upriver to the northern part of Santa Cruz County, the evidence shows a transition between Archaic and Hohokam traditions that ultimately saw the development of crop dependency, new and better ceramic and lithic technologic and larger and more permanent houses. Burials during this period show a mixture of inhumations and cremations indicating the transition of culture. After 400 A.D. the prehistoric occupation along the lower Santa Cruz River greatly resembles the Hohokam cultural patterns and appears to be greatly influenced by the Hohokam culture developing along the Gila River to the north. There is some indication of Mogollon culture influence during this period in the middle Santa Cruz River valley. The upper Santa Cruz River valley, primarily in Santa Cruz County, shows little, if any, settlement during this early period.

In the lower and middle Santa Cruz River valley there is evidence of continuing village development after 750 A.D. and ball courts are found, which is indicative of meso-american influence. The population expanded somewhat between 750 and 950 A.D. and there is evidence of seasonal flood water farming using the natural runoff from gullies and arroyos in the Tucson basin and other areas of the middle Santa Cruz River valley. The population apparently continued to expand and villages or settlements became larger, although fewer in number up through 1400 A.D. Platform mounds appeared and there was more extended use of non-riverine agricultural systems as well as flood water farming. Probably due to lack of water, there is not

much evidence of irrigated farming, although in the middle and lower Santa Cruz River valley some canals have been found, but not nearly to the extent of their usage in the Gila and Salt River valley. By 1400 many of the prehistoric sites appear to have been abandoned. There appears to have been a large decline in population, and the few sites that remained occupied after 1400 have been tied into the upper Pima culture. During this prehistoric period, the 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. These early indigenous inhabitants used the valley as a transportation corridor, as well as the valleys containing minor watercourses or tributaries such as Sonoita Creek and Cienega Creek, but there is no evidence whatsoever of any use of the river or watercourses for travel or navigation. It was a source of water for people traveling through the area and, sometimes in flood season, could be used for irrigation.

2. Historical Settlement in Santa Cruz County

The earliest European explorer to enter southern Arizona was Friar Marcos de Niza who was sent to explore the region in 1539 to search for the Seven Cities of Cibola. The following year de Niza returned with a full-scale expedition led by Don Francisco de Coronado. De Niza and Coronado did not travel up the Santa Cruz valley and probably only touched a corner of Santa Cruz County when the passed through the San Rafael valley traveling east to the San Pedro River valley. There is no history of any