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Comments for the SWRCB's Public Workshop
Regarding
Subterranean Streams Flowing Through Known and Definite Channels
April 24-25,2000

Summary Statement:

Effective administration and protection of the public trust, and effective development of water marketing as a tool for water management, require that the state have the power to regulate groundwater diversions that significantly affect the flow in surface streams. The concept of groundwater flowing in known and definite channels provides that authority in some cases but not in others, and the SWRCB should propose legislation that would provide the necessary authority, using an approach based on hydrologically sensible criteria. In the meantime, the SWRCB should take an expansive view of the authority that it has under existing law, which is justified by the understanding of the phrase "subterranean streams flowing in known and defined channels" when the law was codified in 1914, as exemplified by the case *of Los Angeles v. Hunter* 156 Cal 603 (1909).

Issue 1: What legal test should the SWRCB apply?

The test should be base on an historical understanding of the concept of subterranean streams flowing in known and definite channels, and should be protective of the public trust.

Historical Analysis:

It is widely recognized that California law regarding groundwater (like much other water law) makes little sense, and to understand it all requires that it be considered in terms of its historical development. In order to understand "groundwater flowing in known and definite channels," it is necessary to return to the turn-of-the-century cases, place them in their historical context, and consider the contemporary view of hydrogeology and the relevant law. A good introduction comes from the two editions *ofKinney on Irrigation* (1894 and 1912), an authority relied upon heavily by the California courts, for example in *Los Angeles v. Pomeroy* 124 Cal. 597 (1899), the decision emphasized in the hearing notice. In that decision Justice Beatty began his discussion of the "the proper definition of a surface stream" by noting that "No case involving directly the rights of parties in subterranean streams has been decided in this court, but the law, as applicable to the present case, is well epitomized in the section 48 ofKinney on Irrigation, [first edition] as follows:"

> Subterranean or underground water courses are, as their names indicate, those water currents that flow under the surface of the earth. A large portion of the great plains and valleys of the mountainous regions of the west is underlaid by a stratum of water-bearing sand and gravel, and fed by the water from the mountain range. This water-bearing stratum is of great thickness, the water is moving freely through it, is practicall; inexhaustible, and, if it can be brought to the surface, will irrigate a large portion of the country overlying it. In and near the mountains many streams have a bed which was

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> originally a rocky canyon, but has been filled up with bowlders and coarse gravel. In this debris a large portion or all of the water sinks from sight, to re-appear only when some rocky reef crosses the channel and forces the water to the surface. The movement of this water through this porous gravel, owing to the declivity of the stream, is often quite rapid, and a considerable volume may thus pass down the channel hidden from sight.
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> These watercourses are divided into two distinct classes - those whose channels are known or defined, and those unknown and undefined [note that Kinney has his conjunctions backwards here]. It is necessary to bear this distinction in mind in our discussion, as they are governed by entirely different principles of law. And in this connection it will be well to say that the word 'defined' means a contracted and bounded channel, though the course of the stream may be undefined by human knowledge; and the word 'known' refers to knowledge of the course of the stream by reasonable inference.
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> The owner of land under which a stream flows can, therefore, maintain an action for the diversion of it if such diversion takes place under the same circumstances as would enable him to recover it if the stream had been wholly above ground. But for this purpose the underground water must flow in known and well-defined channels, so as to constitute regular and constant streams, in order that the riparian owner or appropriator may invoke the same rules as are applied to surface streams, or otherwise the presumption will be that they have their sources in the ordinary percolations through the soil. This rule practically disposes of the second class of subterranean waters - those whose channels are unknown and undefined - although there are undoubtedly a great many underground streams whose waters flow in confined channels but whose courses are not known, and, following the above rule, these are classified with percolating waters.

Known subterranean streams were further distinguished as "independent" or "dependent," depending upon their relations with a surface stream. Dependent subsurface streams, the "underflow" of the associated streams, "may be defined as those [waters] which slowly find their way through the soil, sand, and gravel constituting the beds of streams, or the lands under and adjacent to the surface streams, and are themselves a part of the surface stream." Independent subsurface streams were primarily underground, although they might reach the surface in places or from time to time.

It is important to recall that the law ofgroundwater generally was being radically changed in this period. When the first edition of Kinney on Irrigation was published in 1894, the issue was simple: percolating groundwater was part of the soil, following the English common law rule of *Acton v. Blundell* 152 End. Rep. 1223 (Ex. 1843). Whether groundwater flowed through a known and defined channel was therefore a threshold question for judicial resolution of disputes between users ofgroundwater, but until the development of effective means for exploiting groundwater, courts made do well enough with this approach. With increasing exploitation of groundwater toward the end of the 19th Century, however, the number, complexity, and seriousness ofgroundwater cases also increased. This was particularly true in southern

California, where a decade of plentiful rainfall from the mid-1880's to the mid-1890's concealed the overdevelopment ofgroundwater resources that became evident in a following series of dry years. Part of the response was development of the correlative rights doctrine, beginning with *Katz v. Walking haw* 141 Cal 116 in 1902. As noted in the second (1912) edition *ofKinney on Irrigation:* "Since the first edition of this work was written, in 1893, the courts have been called upon to decide certain questions relative to underground waters which either had never been raised or had never been decided before."

In response to this situation, Kinney in the second edition developed a rather confused classification of percolating waters into four categories: diffused percolations, percolating waters tributary to surface water courses or other bodies of surface waters, percolating waters tributary to underground reservoirs or other bodies of underground waters, and seepage waters; artesian groundwater got a separate chapter.

"Diffused percolations" were described as governed by the old common law rule of absolute ownership, as in *Newport v. Temescal Water Co.* 149 Cal. 531 (1906), where the court noted that "(T)he decision in *Katz v. Walkinshaw* is adhered to, but the plaintiffs, on the facts, failed to establish any ground for relief under the principles there laid down." Seepage waters referred to water with an artificial source, such as leaky reservoirs or irrigation canals, or irrigated fields. Percolating waters tributary to either surface or subsurface streams or reservoirs were what could be called "correlative rights groundwater." Artesian groundwater was treated separately, because its use entailed a distinct set of problems and regulations, mainly intended to prevent waste from untended, abandoned, or improperly constructed wells.

To make a long story short, the problem of dealing with disputes among users of groundwaters was approached in two ways. On the one hand, hydrological investigations developed information needed to classify groundwater as flowing in known channels, allowing disputes to be handled by application of surface water law. On the other hand, the California Supreme Court developed the correlative rights doctrine, which allowed for handling disputes among users of groundwater without making findings about buried channels. In the end, the second approach prevailed, and the first languished, but even a decade after Katz it was not obvious that this would happen. In the 1912 edition Kinney wrote:

> It is plain to see that, as the years go by, the class of diffused percolating waters will be growing smaller and smaller. This is due the scientific investigations of the movements of percolating waters through the ground, and also to the discoveries which are constantly being made that certain waters which were once considered mere percolations flowed in defined subterranean channels which have become known. This is particularly true in arid countries, as, for example, the Western portion of our own country, where the demand for water is great, and enterprise and scientific investigations stimulated thereby. In time, if the courts are as active in establishing new rules governing subterranean waters within the next few years as they have been in the past ten years, which rules have but kept pace with the scientific investigations upon the subject, this class of subterranean waters will pass from the class of those flowing in unknown courses to those flowing in known courses, and the "secret incomprehensible

influences," and "practical uncertainties" will become comprehensible influences and practical certainties. (Sec 1188)

Why did Kinney get it so wrong? A brief consideration of major cases helps to clarify the sequence of developments.

Los Angeles v. Pomeroy 124 Cal 597(1899)

In Pomeroy, the Court noted that the main question was the proper definition of a subterranean stream: "(T)here is no dispute...as to the proposition that subterranean streams flowing in known and definite channels are governed by the same rules that apply to surface streams." The Court determined that the available evidence allowed a reasonable inference that the subsurface extensions of the Cahuenga and Verdugo hills form the bed and banks of a subterranean stream near the outlet of the San Femando basin, and that subsurface flow occurred. The Court distinguished cases relied upon by the defendants as lacking "evidence comparable to the evidence here of an underground stream," and found that "... the instructions of the [trial] court contain a sound and correct statement of the law as it applies and ought to apply to streams of the character of the Los Angeles river." Unfortunately, as discussed below, the instructions are anything but clear, and more than a century later we are still arguing about the matter..

Katz v. Walkinshaw 141 Cal 116 (1902)

The court began to set down the correlative rights doctrine in this case, and it dismissed the plaintiffs claim of riparian rights to the artesian groundwater in question in order to do so, noting that "It is quite manifest that this body (if it can be so styled) of percolating water cannot be called an underground watercourse ... unless we are prepared to abolish all distinction between percolating water and the water flowing [in known and definite channels.]" It is important to realize, however, that artesian water was traditionally treated as percolating water (Kinney, 2d Ed., Sec. 1176), so the plaintiffs were asking for an expansion of the traditional concept of underground streams, which the court declined to make. Unfortunately, the court's discussion of the geological context of the case sheds little light on its view of the where the distinction properly lies, and the court could as well have skirted the riparian claim by finding an insufficiency of evidence to overcome the presumption that groundwater is not flowing in known and definite channels.

McClintockv. Hudson 141 Cal. 275 (1903):

This case extended the correlative rights doctrine to percolating water that supplies streams. The trial court in McClintock found that water diverted by a tunnel was not part of the subsurface flow a nearby stream. The defendants moved for a new trial, challenging among other things the "sufficiency of the evidence to sustain the finding that the tunnel does not take water from the San Jose Creek..." Writing for the court. Justice Shaw stated that while it seemed clear that the tunnel did take water from the creek, the rule established in Katz made it unnecessary to make that finding in order to order a new trial:

> By the principles laid down in that case it is not lawful for one owning land bordering upon or adjacent to a stream, to make an excavation in his land in order to intercept and obtain the percolating water, and apply such water to any use other than its reasonable

use upon the land from which it is taken, if he thereby diminishes the stream and causes damage to parties having rights in the water there flowing .

Hudson v. Dailey 156 Cal 617(1909):

This decision, also written by Shaw and dealing with San Jose Creek, followed McClintock in de-emphasizing the difference between percolating groundwater and water in subterranean streams. The court found that the plaintiffs appeal would be denied whether or not the groundwater in question were the underflow of San Jose Creek; if it were, the defendants were riparian to the underground stream, or were protected by the statute of limitations; if it were percolating groundwater that supplied the stream, they had equivalent rights to put the water to reasonable use on their land. "There is no rational ground for any distinction between such percolating waters and the waters in the gravels immediately beneath and directly supporting the surface flow, and no reason for applying a different rule to the two classes, with respect to such rights, if, indeed, the two classes can be distinguished at all. Such waters together with the surface stream supplied by them, should be considered a common supply, in which all who by their natural situation have access to it have a common right..."

Los Angeles v. Hunter 156 Cal 603 (1909)

This case involved an upstream extension ofPomeroy. In the trial court, the city successfully asserted its paramount pueblo right to groundwater under about five thousand acres in the southeastern end of the San Fernando Valley, on the basis that the water was part of the subsurface flow of the Los Angeles River. The Supreme Court, in a decision that is not a model of clarity, pointed out that even if the groundwater in question had not yet joined the subsurface flow of the Los Angeles River, the city would nevertheless have a paramount right to it, under the extension of the correlative rights doctrine set down in McClintock v. Hudson. However, in a portion of the decision that was not mentioned in the headnotes, and seems to have been overlooked by commentators, the court also stated that "The finding [by the trial court] that the waters developed in the wells of the appellants are part of the subsurface flow of the Los Angeles River was, as above discussed, abundantly sustained by the evidence."

The evidence will be described below, but the immediate point is that the court reformulated the questions in McClintock and Hunter in a way that simplified its task. It was only necessary to consider evidence of a significant hydrological connection between the diversions in question, rather than the more complicated (and boring) evidence needed to establish the existence and limits of a subsurface stream. As the Court had noted in Hudson: "There will always be great difficulty in fixing a line, beyond which the water in the sand and gravels over which a stream flows and which supply or uphold the stream, ceases to be a part thereof and becomes what is called percolating water." The court preferred to avoid the issue, but while setting out the basis for doing so in the future, it nevertheless upheld the trial court's findings in Hunter.

Since 1909, the court has heard relatively few cases dealing with subsurface streams, in part because attention turned to building dams or importing water as sources of supply. Instead, the concept of subsurface streams subsided into obscurity, as evidenced by the scant attention given to it by the Governor's Commission to Review California Water Rights Law in the late 1970's. The impression that I get from reading these and other early cases is that the court's disinclination to deal with subsurface flow in known and definite channels was largely shaped by

Chief Justice Shaw, who thought it a superfluous issue, as he noted in Hudson v. Daily. Shaw went further in his discussion ofFomeroy in "The development of the law of water in the west," 10 Calif. Law Review 443, 453, 1922: he simply wrote the concept out of the story.

> The same question ... came up in a later case between the city and other parties and the Supreme Court decided that, under the grant to the ancient pueblo of Los Angeles to which the present city had succeeded, the right of the city to the water of the river was paramount to that of the owners of the riparian land along its course, and that the owner of such land could not lawfully diminish the flow of the stream by means of excavations in the land adjacent thereto, *although the water was not taken directly from the stream,* but seeped through the loose formation of sand and gravel into the excavations. This rule has been followed ever since in all cases where persons having rights to the natural stream were threatened with injury by extraction of the percolating water which sustained and supported the stream in its flow. (emphasis added)

Since Shaw presided over the trial ofPomeroy and wrote the instructions that were approved by the court, it seems hard to believe that he simply forgot that case hinged on the groundwater being part of the stream. More likely, he remembered very well the hours of testimony by engineers about the details of well logs and other hydrological minutia in the trial ofPomeroy, and regarded development of the correlative rights doctrine as simple judicial self-defense.

In a number of subsequent cases that clearly seem to deal with subsurface streams flowing in known and definite channels, the court simply ignored the concept. For example. *Alien v. Calif. Water and Tel. Co.* 29 Cal.(2d) 466 dealt with the underflow of the Tijuana River, for which appropriative rights had been granted by Water Commission decisions, without ever mentioning underflow or known and definite channels. Instead, the court framed the case in terms of the safe yield of the groundwater basin. However, I have found no cases that modify "the proper definition of a subterranean stream" set down in Pomeroy and applied in Hunter. It is useful, therefore, to consider the language in Pomeroy and the evidence introduced in Hunter, as presented in the appellate record. Unfortunately, the some of the instructions are hard to understand, especially out of historical context, and general statements about the definition of a subterranean stream are not clearly distinguished from statements specific to this case. Instructions 15-21, which deal with the definition of subterranean streams, are summarized below.

Instruction 15 makes the important statement that the bed and banks of a watercourse may consist of any material that effectively confines the flow.

Instruction 16 is complex. It begins with a statement that a watercourse may be underground, or both underground and on the surface. This is followed by a statement that the underground watercourse can be full of permeable material such as sand and gravel (i.e., it need not be a large underground channel such as may occur in limestone). Next is language describing a stream that flows both on and below the surface. The instruction ends with the important note that if an underground watercourse exists, any water reaching it becomes part of the underground stream.

Instructions 17 and 18 continue with an interpretation of the physical facts that, if accepted by the jury, leads to the conclusion that the groundwater in question is part of the Los Angeles River. By this interpretation, groundwater in the San Femando Valley is flowing through subsurface channels that connect Tejunga, Little Tejunga and Pacoima creeks with the Los Angeles River.

Instruction 19 begins by noting that groundwater is not necessarily flowing in a watercourse if it feeds visible flow at a natural or artificial surface; a watercourse needs to have a bed aJid banks, and the flow, while it need not be constant, must be more or less regular, and must flow in a channel "more or less defined." The rest of Instruction 19 and Instruction 20 continue with an interpretation of the physical facts that, if accepted by the jury, leads to the conclusion that the groundwater in question is not part of the Los Angeles or any other river. Instruction 20 ends by noting that groundwater is presumed not to be part of an underground stream, so the burden of proof falls upon the party claiming that it is.

Instruction 21 completes the discussion of the definition of subterranean streams by staling that an underground stream entering a basin can form the equivalent of an underground lake, without losing its identity as a stream, although percolating groundwater can also move through a basin toward a stream without becoming part of it until it has passed through the basin.

The defendants objected that the instructions make the whole San Femando Valley the course of a subterranean stream: "... their criticisms ... are ... that the court understood and intended the jury to understand that nothing is essential to the constitution of a subterranean stream except that the general direction of the flow is discoverable. That in this sense the whole San Femando Valley is a subterranean stream, and the jury might as well have been instructed that there was in this land no percolating water, the property of the defendants."

The Court would not admit the implications of the instructions for the San Femando basin, but insisted that "... it clearly appears that the court was not giving, or intending to give, a definition which would make the whole San Femando basin a subterranean stream." Yet given the court's own summary of the physical facts, instructions 17 and 18 do just that, and when the court returned to this question 10 years later in Los Angles v. Hunter 156 Cal. 603 (1909), it found that interpretation "abundantly sustained by the evidence."

The court did not discuss the proper definition of a subterranean stream in Hunter, nor did it describe the geological evidence. Instead, it noted that "A description of the San Femando Valley, adequate for all the purposes of this consideration, will be found in *Los Angeles v. Pomeroy 124 Cal 597.* The cases *ofKatz v. Walkinshaw,* 141 Cal. 116, and *McClintock v. Hudson* 141 Cal. 275, together with the Pomeroy case cited above, give so full and satisfactory an account of the water conditions existing... and controlling the considerations of the questions here presented that a reference to them renders unnecessary any detailed description." However, the appellate record from Hunter provides such a description, as well as the arguments presented to the court.

Hunter was argued as an underflow case. The appellants relied heavily on Katz, arguing that conditions in the San Femando Valley were like the San Bernardino Valley site ofKatz, and put

much emphasis on artesian conditions in some of the wells in question. They cited Pomeroy on the burden of proof, but simply said nothing about its discussion of the "proper definition of a subterranean stream," and the application of that definition to the adjacent area. They also argued that confining layers isolated the river from most of the alluvium.

Curiously, counsel for Los Angeles did not make much of Pomeroy,' either, nor did they argue from McClintock that a finding of flow in a known and defined channel was unnecessary. Rather, they emphasized the language from McClintock that "the topography of the country and the situation of the San Jose Creek, along with the character of its bed, are alone almost sufficient to prove" that groundwater in the adjacent alluvial deposits was part of the stream, and argued from the topography and general conditions in the San Femando Valley that it was San Jose Creek writ large. They relied on topography to establish the bed and banks of the underground stream, and on hydrographic contours to show the direction of flow. Artesian conditions were described as local, involving only 21 of the 165 wells described in the evidence. The heart of their argument was hydrological, and since the court found that it "abundantly sustained" the finding of the trial court, it deserves attention. It is summarized in the following excerpts from the Los Angeles briefs:

> According to the expert testimony on both sides, that valley was originally a deep canyon, or basin, formed by the uplift of the surrounding mountains, and has been filled with detritus brought into the valley by torrential streams, issuing out of the mountains, and chiefly the range on the northerly side of the valley. The principal streams of this character are the Big Tejunga, Little Tejunga and Pacoima creeks, which flow down canyons of the same names, in the Sierra Madre range, and discharge their waters into the valley basin. Sandy washes, many hundreds of feet in width, extend from the mouths of these canyons clear across the valley to the surface channel of the river. The trend of these washes is first southerly, and then southeasterly, as they approach the lower side of the valley. In the northeasterly comer of "the narrows" a stream issues out ofVerdugo canyon, with a wash extending in a general southerly direction across the valley to the river. In the rainy season of ordinary years, the waters of these streams run down from the mountain canyons onto the plains, and sink into the sands of the washes a few miles from the mouths of the canyons. In seasons of heavy rain-fall they flow in great volumes well out into the valley before disappearing. The Big Tejunga is the largest and most important of these mountain streams, and yields several times as much water as the Pacoima and Little Tejunga creeks together. In times of flood, or sudden and excessive rain-fall in the mountains, its surface flow extends clear across the valley and discharges into the river about nine miles above the city. For several years, in the early nineties, it continued as a surface stream through the summer season until it reached the river, (pp. 45-46)

> So here we have a narrow section of the San Femando Valley, some twelve miles in length, and tapering in width from six miles at its westerly end to two-thirds of a mile at its outlet to the east. It is filled with granitic detritus, consisting of sand, gravel and deposits of silt and clay, which have been brought in from the surrounding mountains by means of water draining directly from the sides of the mountains into the valley, but

Apparently, they could not make any more sense out of Judge Shaw's instructions in Pomeroy than we can

> chiefly by means of torrential streams, of great erosional power, formed in precipitous canyons, as the result of rains, and discharging upon the face of the valley. Its surface has a decided slope from west to east, and from the base of the mountains on the north and east towards the mountains to the south and west, along whose base flows the surface stream of the river. During the annual rainy season, the precipitation of water averages twenty-five to thirty inches on the Sierra Madre Mountains, and about fifteen inches in the face of the valley - and the run-off, whether in the form of streams, or as ordinary surface drainage, trends southerly and south-easterly towards the river, but usually sinks into the porous materials of the valley before reaching the surface stream. We submit that these conditions show a complete correlation between the visible flow of the river on the one hand, and the water discharging into the valley from the mountain shed to the north and east, or precipitated in the form of rain directly upon the floor of the valley, and the accumulations of water in the sands and gravels of the valley, on the other hands. The natural, logical and inevitable result of these conditions, the existence of which is not in dispute, is the surface stream of the Los Angeles river. (pp. 61-63)

> Another circumstance, very pointed and convincing upon the question whether the river is composed of a surface and a subterranean stream, and as to the condition and extent of the underground waters, is the effect on these waters of the sudden convergence of the valley ... At that point, a spur of the Cahuenga ranges extends abruptly into the valley, and with a corresponding, though less marked, intrusion of the mountains on the opposite side, substantially contracts the cross-section of the valley through which the underground waters must pass. By reason of this condition, the movement of these waters is obstructed, the plane of saturation is raised, and they are forced to the surface to a greater extent than at any other point. As stated by Mulholland, in "a distance of less than two miles", the river makes (in 1905) 23.24 second feet, or more than one half of the total mean flow of the stream, (p. 67)

In summary, not that much evidence needed to overcome the presumption that groundwater was "percolating." The existence of a bedrock channel could be inferred from the topography, particularly if augmented by well logs. Flow could be inferred from a groundwater gradient, determined by water surface measurements in wells. Gaining reaches of the stream, where a constriction of the subsurface channel forces flow into the surface channel, were frosting on the evidential cake. The evidence applied to a large area of the San Femando Valley, comparable in spatial scale to, for example, the Salinas Valley.

Public Trust Considerations

The question whether groundwater in the Cannel Valley is subject to the permitting authority of the SWRCB, answered in WRO 95-10, arose because of complaints by environmental groups that unauthorized diversions from the alluvial aquifer of the Carmel River for municipal use were de-watering long reaches of the river in the summer, to such an extent that not only was aquatic habitat lost, but riparian vegetation was destroyed as well, resulting in massive erosion of the sandy banks of the river during subsequent winter flows. Although this