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February 3, 2003

STATE OF CALIFORNIA

STATE WATER RESOURCES CONTROL BOARD

ORDER WRO 2003 -

In the Matter of

Permit 14853 (Application 21883) of

NORTH GUALALA WATER COMPANY, and

Request for Determination of Legal Classification of Groundwater

Appropriated Under this Water Right Permit

SOURCE: Groundwater in alluvium under North Fork Gualala River

COUNTY: Mendocino

ORDER DETERMINING LEGAL CLASSIFICATION OF GROUNDWATER

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1.0 INTRODUCTION

In this proceeding, North Gualala Water Company (North Gualala) is asking the State Water Resources Control Board (SWRCB) to determine whether the groundwater that North Gualala is extracting from its Wells 4 and 5, or might extract from proposed Wells 6 and 7 on its property in the Elk Prairie area, is extracted from a subterranean stream flowing through a known and definite channel. This order determines that the groundwater in question is extracted from a subterranean stream flowing through a known and definite channel.[1]

[1] Some of the commenters at the Board workshop on the first published draft of this order expressed apprehension that this order might indicate that the SWRCB will assert permitting authority over all underground waters contained in all alluvial valleys like the San Fernando Valley, and asked that the Board clarify its intentions. The SWRCB will not make any sweeping declarations regarding the classification of groundwater. The classification of groundwater properly should be based on a factual inquiry. As is apparent from this order, the issue of whether groundwater is in a "subterranean stream flowing through known and definite channels," as provided in Water Code section 1200, is a factual issue dependent on the evidence. Not every valley that may resemble the San Fernando Valley or Elk Prairie necessarily has a subterranean stream flowing through it. Further, not all waters in a valley that has a subterranean stream are necessarily part of the subterranean stream. Without a detailed examination of the hydrogeology of the area in question, therefore, it is impossible for the SWRCB to respond specifically to this question. Any future determinations regarding the classification of groundwater must be factually based, and must be made on a case-by-case basis. The SWRCB intends to comply with its responsibilities under the Water Code. This means that it will require permits only for groundwater that meets the criteria in section 1200.

This order is the result of a hearing conducted by the SWRCB on June 4 and 5, 2002, at the request of North Gualala. By letter dated January 11, 2002, North Gualala requested this determination to establish whether or not it is subject to the requirement that it have a water right permit or license for the water it extracts from its wells described above. North Gualala currently holds Water Right Permit 14853 to appropriate this water. The State Water Rights Board, a predecessor of the SWRCB, issued Permit 14853 to North Gualala on September 3, 1965, with a point of diversion at an infiltration gallery on the North Fork Gualala River. The point of diversion was changed to Wells 4 and 5 in 1999. Permit 14853 requires compliance with various terms and conditions. North Gualala asked for the hearing in this proceeding because it questions whether it must hold and comply with Permit 14853 in order to extract water from Wells 4 and 5 in the Elk Prairie and from proposed wells in the Elk Prairie area.

The SWRCB conducted the hearing in this matter pursuant to a Notice of Public Water Right Hearing dated March 5, 2002. This order is the result of the hearing and is based on the record of the hearing. This is an adjudicative proceeding, and is governed by statutes and regulations as provided at title 23, California Code of Regulations, section 648, et seq. The SWRCB has received written closing briefs in this matter. The SWRCB has considered all of the evidence and arguments in the hearing record.

In the hearing on this matter, a staff team, referred to as the "Permitting Team," from the Division of Water Rights (Division) of the SWRCB appeared and presented evidence regarding the legal classification of the water being extracted by the wells in the Elk Prairie area. The Permitting Team was separated by an ethical wall from the hearing team[2] regarding substantive issues and controversial procedural issues within the scope of the hearing. The Permitting Team does not have the rights of a party in the hearing, and did not present legal argument or a closing brief.

[2] The hearing team is composed of the Board members and the staff assisting the Board members.

2.0 BACKGROUND

North Gualala is in the business of appropriating water and delivering it to customers in and near the town of Gualala, in Mendocino County. North Gualala has four water right permits to appropriate water for municipal use. The cumulative authorized diversion rate under North Gualala's four permits is 4.16 cubic feet per second (cfs), with a cumulative maximum diversion of 1,730 acre-feet per annum (afa) under all four permits. Three of the permits are for surface water diversions. The fourth permit, Permit 14853, authorizes diversion of up to 2.0 cfs of groundwater for municipal use from the North Gualala River. Two wells, termed Wells 4 and 5, are the current authorized points of diversion under Permit 14853. Additionally, North Gualala is considering adding proposed Wells 6 and 7 in the Elk Prairie area. The purpose of this order is to determine whether the groundwater diverted by North Gualala is subject to the SWRCB's permitting authority, in which case North Gualala must comply with Water Right Permit 14853 to take water through the wells and deliver the water to its customers for use.

2.1 General Project Description

The groundwater diversions examined in this order are in an area known as Elk Prairie on the North Fork Gualala River just upstream of its confluence with the Little North Fork Gualala River. The part of Elk Prairie along the North Fork Gualala River consists of about 100 acres, of which North Gualala owns about 12 acres. At the point where the Little North Fork Gualala River joins the North Fork Gualala River, the San Andreas Fault causes the river to turn sharply from flowing westerly to southerly for a distance of about 1.5 miles, before it resumes its westerly flow into the Pacific Ocean. North Gualala currently has two production wells and several monitoring wells in Elk Prairie, and plans to add additional production wells in the future. The two current production wells, and the two planned production wells take water from alluvium under Elk Prairie. These facilities are shown on Figure 1.

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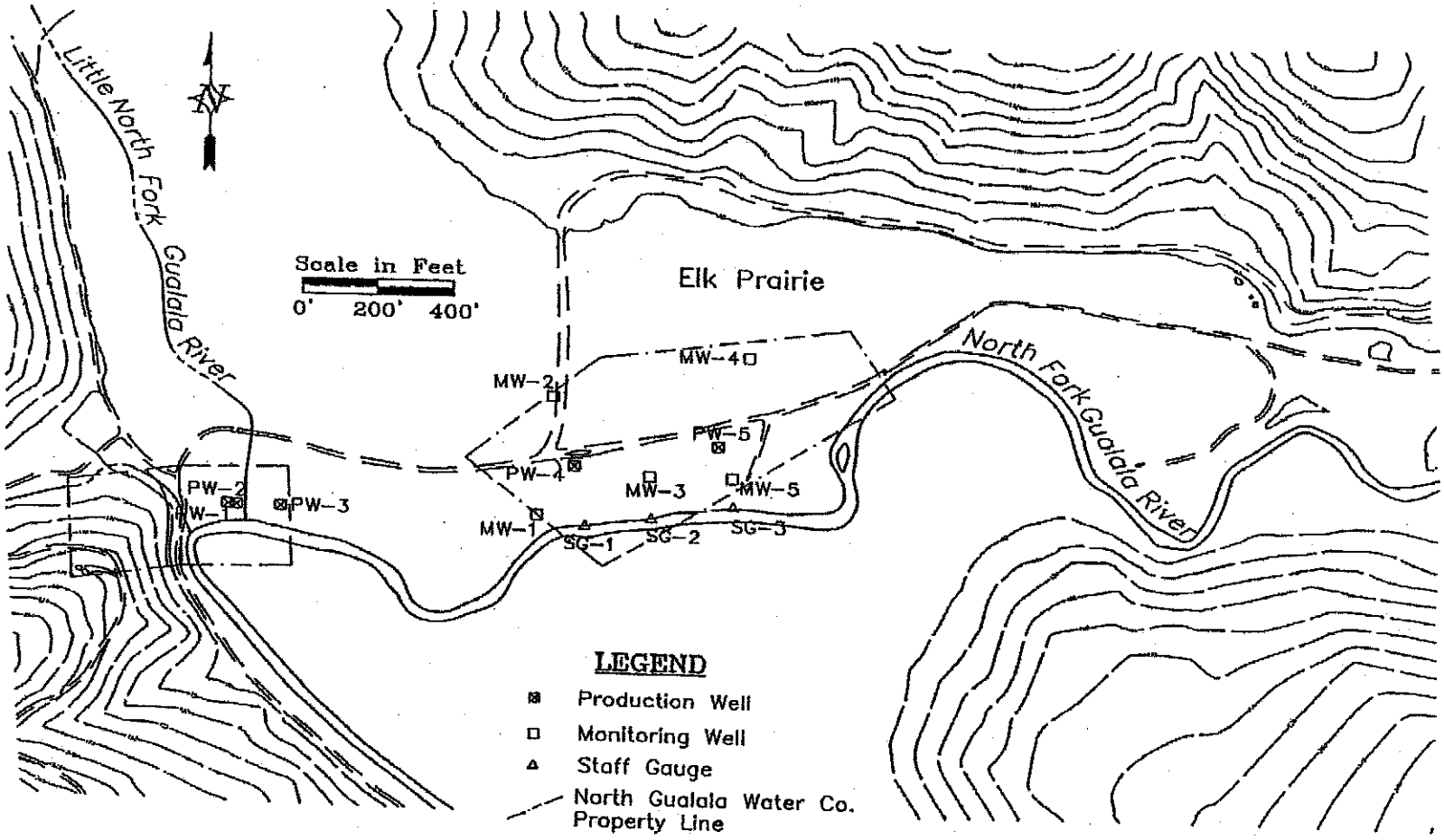

Figure 1
Elk Prairie Well and Staff Gauge Location Map

2.2 Project History

Commencing in 1989, North Gualala constructed Wells 4 and 5 in Elk Prairie, adjacent to the North Fork Gualala River. One ~~A~~ purpose of constructing the wells was to improve the quality of the water delivered to customers and reduce water treatment costs. In 1992, a neighboring company investigated the geology of the Elk Prairie area and concluded that the groundwater in the alluvial aquifer of the Gualala River system is flowing in a subterranean stream and is, therefore, an appropriation of water subject to the water right permitting authority of the SWRCB. In December 1992, based on the hydrogeology report produced by the neighboring company, the Division recommended to North Gualala that it obtain a water right permit for Wells 4 and 5. North Gualala disputed the need for a water right permit for the wells, and in 1998 submitted a report to the Division, concluding that the wells do not take water from a subterranean stream and consequently do not require a permit to appropriate the water. The Division indicated that it was not satisfied that the groundwater being extracted is not taken from a subterranean stream. In response, North Gualala petitioned for a change of point of diversion under Permit 14853, seeking to delete the infiltration gallery as a point of diversion and add Wells 4 and 5 as points of diversion. In Order WR-99-09-DWR, the Chief of the Division approved the petition, subject to terms and conditions. In Order WR 99-011, the SWRCB affirmed Order WR-99-09-DWR in response to a petition for reconsideration. North Gualala reserved its right to ask the SWRCB for a hearing on the classification of the groundwater.

3.0 ISSUES FOR HEARING AND PARTIES' POSITIONS

3.1 Key Hearing Issues

The hearing notice specified the following two Key Issues: ~~and included the explanation of the key issues as set forth below.~~

1. **"Are North Gualala Wells 4 and 5 extracting groundwater that is subject to the laws governing surface water rights, including the requirement of a permit or license to appropriate the water?**

2. **"Would North Gualala extract groundwater that is subject to the laws governing surface water rights if it installs and pumps groundwater from new wells on its property in the Elk Prairie area?**

The hearing notice included the following explanation of the key issues:

> "If the SWRCB determines that the groundwater considered in this hearing is subject to the laws governing surface water rights, North Gualala must have and must comply with a water right permit in order to extract the groundwater. If the groundwater is not subject to the laws governing surface water rights, North Gualala will not need a water right permit to extract the groundwater. The participants will be given an opportunity both to explain their positions regarding the applicable law governing permitting requirements for groundwater and to provide relevant evidence. Evidence presented should include evidence that supports any tests a participant advocates the SWRCB using to determine the classification of the groundwater in question."

3.2 Questions for Closing Briefs

After the hearing, the hearing officer sent a letter to the parties posing the following questions to be addressed in the closing briefs of the parties. Closing briefs were due on August 23, 2002.

1. "What findings of fact relevant to the key issues should the SWRCB make, based on the evidence received by the SWRCB during its hearing on June 4 and 5, 2002?
2. "What legal authorities should be considered in determining whether groundwater in the alluvium under Elk Prairie is subject to the laws governing surface water rights and whether its extraction requires a water right permit or license? Applying these legal authorities to the findings of fact you are recommending the SWRCB make, what conclusions of law do you recommend the SWRCB make? Please explain your reasoning in detail with citations to authority.
3. "Is there a known and definite channel bounding the alluvium under the surface of the North [Fork] Gualala River at Elk Prairie? Is there a known and definite channel bounding the alluvium under the surface of the North [Fork] Gualala River in the reach between Robinson Creek and Little North Fork Gualala River? Can the course of any channel be determined by reasonable inference?
4. "Are Wells 4 and 5 drawing water from the alluvium at Elk Prairie? Will proposed Wells 6 and 7 draw water from the alluvium?
5. "What is the general direction of flow of groundwater under the North [Fork] Gualala River between Robinson Creek and Little North Fork Gualala River? What is the general direction of flow of groundwater under the North [Fork] Gualala River at Elk Prairie?
6. "a. What is the permeability of the Franciscan Rock below and on the two sides of the North [Fork] Gualala River at Elk Prairie and in the reach between Robinson Creek and Little North Fork Gualala River?

   "b. What is the permeability of the alluvium at Elk Prairie and in the reach between Robinson Creek and Little North Fork Gualala River in these two reaches?

7. "If groundwater flows from fractured bedrock into alluvial materials, does that preclude the existence of a subterranean stream?
8. "Is the direction of groundwater flow, relative to the direction of flow in a surface stream at a particular point in the system, a determining factor to establish the existence of a subterranean stream flowing through a known and definite channel?"

3.3 Positions of the Parties

There are two parties in this proceeding: North Gualala and the Department of Fish and Game (DFG). North Gualala takes the position that no water right permit is required for its extraction of water through its wells in the Elk Prairie adjacent to the North Fork Gualala River. North Gualala argues that the physical characteristics at Elk Prairie do not meet all of the elements of the test the SWRCB has most recently used for determining the legal classification of ground water.

DFG takes the position that the water North Gualala is taking is coming from a subterranean stream flowing in a known and definite channel under the North Fork Gualala River, including the Elk Prairie area. Consequently, DFG argues that a permit is required and that all elements of the test most recently applied by the SWRCB to determining the legal classification of ground water are present. DFG's policy concern is that unless the SWRCB regulates North Gualala's diversions, North Gualala would be able to significantly expand the volume of its diversions of water from its wells without needing to meet conditions to protect natural resources. DFG believes that excessive pumping could reduce flows in the river to a level that is inadequate for fish protection.

The differences between the two parties primarily focus on the interpretation of the evidence and the application of the law, not on the actual evidence.

4.0 DISCUSSION OF EVIDENCE AND ARGUMENTS

The basic issue in this case is whether North Gualala needs a water right permit to extract groundwater from the alluvium under Elk Prairie via its Wells 4 and 5 and/or via its proposed Wells 6 and 7. Water Code sections 1200 and 1201 together describe the water that is subject to

appropriation in accordance with the Water Code, and thus is subject to the SWRCB's permitting authority. Section 1200 provides:

> "Whenever the terms stream, lake or other body of water, or water occurs in relation to applications to appropriate water or permits or licenses issued pursuant to such applications, such term refers only to surface water, and to subterranean streams flowing through known and definite channels." (Emphasis added.) (Wat. Code, § 1200.)

Water Code section 1201 provides:

> "All water flowing in any natural channel, excepting so far as it has been or is being applied to useful and beneficial purposes upon, or in so far as it is or may be reasonably needed for useful and beneficial purposes upon lands riparian thereto, or otherwise appropriated, is hereby declared to be public water of the State and subject to appropriation in accordance with the provisions of this code." (Wat. Code, § 1201.)

The determination in this case hinges on the meaning of the phrase "subterranean streams flowing through known and definite channels" in section 1200. Section 1200 was codified from section 42 of the Water Commission Act of 1913.[3] The above phrase, now in section 1200, is unchanged from the wording in section 42 of the 1913 Act. (Stats. 1913, ch. 586, § 42.) No California appellate court decision interprets this phrase in the context of the SWRCB's permitting authority, which dates from 1914. One federal court decision, however, held that the United States had to obtain a water right permit to appropriate groundwater from a subterranean stream. (*United States* v. *Fallbrook Public Utility District, et al.* (9th Cir. 1965) 347 F.2d 48, 55-56.)

Several California appellate decisions find the existence of a subterranean stream in the context of claims of pueblo rights, pre-1914 appropriative rights, and riparian rights. (*City of Los Angeles* v. *Pomeroy* (1899) 124 Cal. 597, 632 [57 P. 585] (the Los Angeles River flows in both a surface stream and a subterranean stream in the reach between the Cahuenga and Verdugo

[3] As set forth in section 42 of the Water Commission Act, the sentence that is now Water Code section 1200 read: "Whenever the terms stream, stream system, lake or other body of water or water occurs in this act, such term shall be interpreted to refer only to surface water, and to subterranean streams flowing through known and definite channels."

Hills); *City of Los Angeles* v. *Hunter* (1909) 156 Cal. 603 [105 P. 755] (the groundwater in the San Fernando Valley is part of the subterranean flow of the Los Angeles River); *Vineland Irrigation District* v. *Azusa Irrigating Company* (1899) 126 Cal. 486 [58 P. 1057] (the San Gabriel River has a well-defined subsurface stream that is subject to appropriation); *Cross* v. *Kitts* (1886) 69 Cal. 217 [10 P. 409]; *Rancho Santa Margarita* v. *Vail* (1938) 11 Cal.2d 501 [81 P.2d 533] (the surface and subsurface parts of the stream are a common supply, and downstream riparian right holders cannot require the full flow of the surface stream when they can reasonably take water from the subsurface part of the stream[4]).

The *Pomeroy* opinion is the leading opinion on the definition of a subterranean stream. *Pomeroy* distinguishes between the characteristics of a subterranean stream and percolating groundwater. In 1899, the courts believed, based on English common law, that a groundwater diverter could take water for use on lands apart from the overlying lands only if the source groundwater was flowing in a subterranean stream. If the source groundwater was percolating, it ~~could be used only on~~ was considered a part of the overlying land, and could be used only by the overlying landowner ~~of which it was considered a part~~. (*Pomeroy*, at 124 Cal. 597, 621; *Hanson* v. *McCue* (1871) 42 Cal. 308; *Gould* v. *Eaton* (1896) 111 Cal. 639.) Accordingly, it was important to make a distinction between subterranean streams and percolating groundwater.

Only a few cases follow *Pomeroy*, because a few years after *Pomeroy* was decided, the California Supreme Court rejected the common law regarding percolating groundwater and decided that in California, percolating groundwater could be appropriated by persons who did not own the overlying land for use on non-overlying lands, so long as its appropriation did not injure the owners of the overlying land. (*Katz* v. *Walkinshaw* (1903) 141 Cal. 116 [74 P. 766].) In 1903, in the absence of a permitting system, this change made it unnecessary for the courts to receive and analyze evidence regarding the existence of a subterranean stream when a dispute arose between an appropriator and an overlying landowner. A number of cases have followed the *Walkinshaw* opinion in disputes between competing users of water, both before and after 1914. (*Miller* v. *Bay Cities Water Co* (1910) 157 Cal. 256 [107 P. 115]; *City of*

[4] The *Fallbrook* decision cited above addresses the same surface and subterranean stream system as the state court decision in *Vail*, and builds upon the *Vail* decision.

San Bernardino v. *City of Riverside* (1921) 186 Cal. 7 [198 P. 784]; *City of Pasadena* v. *City of Alhambra* (1949) 33 Cal.2d 908 [207 P.2d 17].)

In describing the water that is subject to permitting, the 1913 Water Commission Act requires permits and licenses for water diverted from "subterranean streams flowing through known and definite channels." This language tracks the language in ~~comes from~~ the *Pomeroy* opinion, which states that, "subterranean streams flowing through known and definite channels are governed by the same rules that apply to surface streams." (*Pomeroy, supra,* at 632.) Stated another way, to be in a subterranean stream, and therefore subject to the laws that apply to surface streams, groundwater must act like a surface stream. The court in *Pomeroy* described the subterranean stream at issue as having "comparatively impervious" mountain sides. (*Pomeroy, supra,* at 632.) The court went on to state: "...'[D]efined' 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." (*Id.*, at 633.) Under *Pomeroy*, the presumption stated in the trial court instruction to the jury was that groundwater is not part of a stream or water course, and is not flowing in a definite channel. The burden of proof was on the party asserting that groundwater is "flowing in a natural water course or in a defined channel or [is] a part of a stream." (*Id.*, at 628.)[5] In *Pomeroy*, the City of Los Angeles proved the existence of a subterranean stream by providing "evidence from which a reasonable inference could be drawn that the channel was bounded and defined by the sloping sides of the Cahuenga and Verdugo Hills meeting underground, and that there was a subsurface flow corresponding with the surface flow from west to east out through the gap." No excavation beneath the surface or other test was required to make this inference. (*Id.*, at 634.) The only area at issue in *Pomeroy* was the comparatively narrow outlet of the San Fernando Valley between the Cahuenga Range and the Verdugo hills. The court stated that the pass is from 1 ½ to 2 ½ miles in width on the surface. (*Id.*, at 632.)

[5] The evidence presented in the hearing meets the burden of proof in the *Pomeroy* jury instructions that the groundwater pumped by the wells is flowing in a subterranean stream in a defined channel. Further, the evidence overcomes the presumption stated in *Pomeroy* that the groundwater is not part of a subterranean stream flowing in a defined channel.

Ten years after the *Pomeroy* decision, in *City of Los Angeles* v. *Hunter*, *supra*, the California Supreme Court revisited the classification of the groundwater in the San Fernando Valley on a broader scale. In *Hunter*, the City of Los Angeles prevailed in a quiet title action against 207 landowners pumping water from wells on about 5,000 acres in the southeastern part of the San Fernando Valley, establishing the paramount right to the subterranean flow of the Los Angeles River. (156 Cal. 603.) Some of the wells were two or three miles distant from the banks of the surface flow of the Los Angeles River, although the average distance was 1,000 feet. The court found that all of the groundwater in question, from the ground surface to bedrock, was part of the subterranean stream of the Los Angeles River. The court described the valley as a "great lake filled with loose detritus, into which the drainage from the neighboring mountains flows, and the outlet of which is the Los Angeles River." (*Id.*, at 607.) All of this water was flowing more slowly than it would in an open lake, but was generally moving southeasterly to the Narrows, through which the Los Angeles River flows. Based on these facts, the court stated that the waters of the San Fernando Valley are not "percolating waters" in the common law sense of the term. (*Id.*, at 607.)

The above cases are helpful in interpreting Water Code section 1200. The SWRCB, in a previous case based primarily on the *Pomeroy* decision, described the physical conditions present in a subterranean stream flowing through a known and definite channel as follows:

1. A subsurface channel must be present;
2. The channel must have relatively impermeable bed and banks;
3. The course of the channel must be known or capable of being determined by reasonable inference; and
4. Groundwater must be flowing in the channel. (SWRCB Decision 1639, p. 4.)

4.1 North Gualala is Taking Water From a Known Subsurface Channel

North Gualala agrees in its closing brief that a subterranean channel exists and that the course of the subterranean channel can be determined by reasonable inference. ~~,and~~ Consequently, ~~that~~the first and third elements of the test in D-1639 ~~is~~are satisfied. The evidence received during the hearing establishes both that a subsurface channel filled with alluvium lies beneath Elk Prairie and that the course of the subsurface channel beneath Elk Prairie can be determined by

reasonable inference. There is no dispute among the parties on the existence of these elements of the test. Accordingly, the evidence satisfies the burden of proving both the first and the third elements in D-1639 ~~are proved~~. North Gualala is drawing water through its wells within the boundaries of the subsurface channel.

4.1.1 Presence of a Known Subterranean Channel

The North Fork Gualala River lies in an incised bedrock canyon cut into the Triassic/late Cretaceous age Franciscan Formation. (R.T., pp. 90-91; DFG 1, p. 4.) The bedrock canyon forms the bed and banks of the subterranean channel. Geologic maps of the area show the alluvium of the North Fork Gualala River filling the bottom of this incised bedrock canyon. (DFG 1, pp. 5-8; DFG 9; NGWC 9; Permitting Team 1, p. 5.) A geophysical survey of the Elk Prairie area shows that the bedrock canyon is filled with alluvium extending below the valley floor to depths of about 170 feet. (R.T., pp. 35-36; NGWC 8, p. 6.) This is consistent with estimates of the depth of alluvium in the North Fork Gualala River that range from approximately 85 feet to 180 feet based on projection of adjacent bedrock slopes. (R.T., p.92; DFG 24.)

The near-surface deposits at Elk Prairie consist of fine-grained soils, ranging from sandy silt to silty clay. (DFG 14, p. 7; NGWC 8, p. 7.) Under these soils there is a coarser-grained alluvial aquifer consisting mostly of sands and gravels with occasional interbeds of fine-grained materials. (R.T., pp. 90-91; DFG 14, p. 7, Figs. 2-2, 2-3, and 2-4; NGWC 8, p. 7, Figs. 2-2, 2-3, and 2-4.) Geologic cross-sections show that the coarse-grained alluvial aquifer overlies a fresh Franciscan bedrock unit. (DFG 14; NGWC 8, Figs. 2-2 and 2-3, pp. 6-7.) The fresh bedrock unit is described as, "[s]lightly weathered well-fractured Franciscan sandstone with an occasional well-weathered (clayey) zone." (R.T., pp. 91-92; DFG 15, last page.) Bedrock fractures are described as being "very tight."

No dispute appears from the evidence as to the presence of a subterranean channel. When discussing whether element 1 of the D-1639 test is satisfied, North Gualala Water Company's expert witness testified, "Is there a channel present? Probably so. You can map something up there that looks like a subterranean channel." (R.T., p. 51.) When discussing whether element 3

of the D-1639 test is satisfied . ~~T~~the witness ~~also~~ testified ~~that~~, "Is there a course of channel that could be defined? Probably so. We can map it reasonably so with the work that's been done to date." (R.T., p. 51.)

The presence of the subsurface channel is demonstrated by: (1) the incision of the canyon during the last glacial period to a depth of at least 170 feet greater than today's alluvium surface (R.T., pp. 35-36); (2) the Holocene coarse-grained alluvium filling between the incised bedrock canyon walls through which the North Fork Gualala River flows today (R.T., p. 91); and (3) the bounding of the coarse-grained alluvium by ~~either fine-grained alluvium or fresh~~ Franciscan Formation sandstone bedrock. (R.T., pp. 90-91; DFG 1, pp. 7-8.)

The course of the subterranean channel can be determined simply by projecting the slopes of the canyon to where the sides meet beneath the alluvium. (R.T., p. 92; DFG 1, p.15, 23-24.) The difference in permeability between the bedrock and the alluvium creates a subsurface channel ~~of preferential groundwater flow~~. The course of the subterranean channel is known by the trace of the bedrock/alluvium contact shown on the map in the Permitting Team's Exhibit 1, Figure 2. (Permitting Team 1, p. 4.) As discussed below in section 4.3, based on the groundwater gradient measured from groundwater levels, groundwater flows in the channel beneath North Gualala's property. (NGWC 8, Figs. 4-4 and 4-5.)

4.1.2 Source of Water Drawn from Wells at Elk Prairie

Wells 4 and 5 pump groundwater directly from the alluvial materials under the Elk Prairie, and proposed Wells 6 and 7 on the NGWC property at Elk Prairie would pump groundwater from the alluvial materials. (R.T., pp. 36-37; NGWC 7, pp. 10, 23, Fig. 18.) All the current and future production and monitoring wells addressed in the hearing are or would be completed in these alluvial deposits at Elk Prairie. (NGWC 7, p. 6.) Wells 4 and 5 are screened within the alluvial aquifer and therefore, the groundwater pumped by these wells comes directly from the alluvial materials. (NGWC 8, Figs. 3-1 and 3-2.)

4.2 Presence of a Definite Channel with Relatively Impermeable Bed and Banks

One of the elements of a subterranean stream subject to SWRCB permitting authority under Water Code section 1200 is a "definite channel." Under the *Pomeroy* test discussed in D-1639, the ~~defined~~ channel is considered defined if it has a contracted and bounded channel. Neither of the terms "contracted" and "bounded" enjoys modern usage. "Bounded" means the channel has boundaries.

"Contracted" implies that the channel is limited in some way. North Gualala argues that "contracted" means that the channel must be narrowing. A number of different dictionary definitions of "contract" exist. In *Pomeroy*, however, the court clearly found that the subterranean stream in question was flowing in a known and definite channel, while describing the channel as having "comparatively impervious" beds and banks and stating that the channel was bounded and defined by the sloping hillsides on either side meeting underground. (*Pomeroy, supra*, 124 Cal. 597, 632-634.) Ten years later, in *Hunter*, in addressing the groundwater classification of approximately 5,000 acres in the southeastern part of the valley, the California Supreme Court characterized the entire San Fernando Valley as a great natural lake or reservoir through which the subterranean stream of the Los Angeles River flows, and rejected the argument that the waters in the valley were "percolating waters" in the common-law sense. (*Hunter, supra*, 156 Cal. 603, 606-607.) Considering the hydrogeologic characteristics of the San Fernando Valley as described in *Pomeroy* and in *Hunter*, and the treatment of the San Fernando Valley as a subterranean stream, a subterranean stream can run through an underground lake without losing its classification; the limiting characteristic is simply that its bed and banks must generally confine the water to the stream and prevent its wandering based on gravity. (*Hunter, Id.*, at 607.) Accordingly, the second element listed in D-1639, "the channel must have relatively impermeable bed and banks," accurately describes a definite channel.

Under Elk Prairie, an adequate differential in permeability between the alluvium and the bed and banks of the underground channel exists to support a definite channel. The permeability of the alluvial aquifer beneath Elk Prairie is greater than the surrounding Coastal Belt Franciscan bedrock by ~~a factor of~~ 2.5 to 3 orders of magnitude ~~times~~, based on calculations of both specific capacity and hydraulic conductivity. (R.T., pp. 51, 94; DFG 1, pp. 8, 10.) Based on the well and

aquifer testing, the average transmissivity of the aquifer materials beneath Elk Prairie is between 300,000 and 400,000 gpd/ft, and the corresponding hydraulic conductivity is approximately 4,500 gpd/ft^2. Both are high values, typical of coarse sands and gravels such as are present in the aquifer beneath Elk Prairie. (NGWC 8, p. 41.) The specific capacity of the pumping wells (the amount of water yielded per foot of drawdown) ranged from 90 gpm/ft (gallons per minute per foot) for Well 5 to 130 gpm/ft for Well 4. (R.T., p. 94; NGWC 8, pp. 11-12.) Step-drawdown pump tests indicated that Wells 4 and 5 could yield a respective maximum pumping rate of 850 and 700 gpm (gallons per minute) with respective drawdowns of 7.4 and 9 feet. (NGWC 8, pp. 11-12.)

Based on regional groundwater studies of coastal Mendocino County and Sonoma County, the average specific capacity for Coastal Belt Franciscan wells is 0.265 gpm/ft. (R.T., p. 94; DFG 6, Table 6.) Another study found that the yields of wells drilled into the Franciscan bedrock generally are low, ranging from 1 to 3 gpm with an average specific capacity of 0.22 gpm/ft. (DFG 16, pp. 147-148.) The Franciscan bedrock has no primary permeability and no primary porosity, but it fractures readily, and the fractures can contain water. (R.T., pp. 25, 62.)

The same permeability contrast that exists at Elk Prairie likely exists throughout the course of the subsurface channel in the North Fork Gualala River between Robison Creek and the confluence with the Little North Fork Gualala River. The entire subsurface channel in this reach is surrounded by the same Coastal Belt Franciscan bedrock and filled with virtually the same alluvial materials that are found beneath Elk Prairie. (DFG 9.) Although the record contains only general data for alluvial material outside of the Elk Prairie area, it is likely the same materials are found throughout the North Fork Gualala River Canyon, and that the same permeability contrast exists.

The demonstrated relative difference in permeability between the Franciscan bedrock and the alluvium filling the channel establishes that the Franciscan bedrock forms a channel with relatively impermeable bed and banks. This difference in permeability, together with the existing hydraulic gradient toward the alluvium, creates a subsurface channel in which groundwater flows preferentially. (Permitting Team 1, pg. 5.) ~~This is due to the fact that~~ The

difference in permeability, together with the groundwater gradient (NGWC 8, Figs. 4-4 and 4-5.), is adequate to prevent the dispersal or wandering of the water, once it is in the channel, into the surrounding bedrock. Based on the prevailing hydraulic conditions at Elk Prairie, w~~W~~ater may flow from the bedrock, but it does not flow back into the bedrock from the subterranean stream. (R.T., pp. 256-257.)

Based on the foregoing discussion, the evidence in this case is sufficient to establish a reasonable inference that the water pumped by North Gualala at its current and proposed wells is pumped from a known and definite channel. This evidence meets the second element of the test set forth in D-1639, that the channel must have relatively impermeable bed and banks. This evidence likewise meets the burden of proof and overcomes the presumption stated in the *Pomeroy* trial court's jury instructions discussed above, with respect to the requirement of a defined channel. (*Pomeroy, supra*, at 628.)

4.3 Existence of Flow of Groundwater in the Subterranean Channel

The final element discussed in *Pomeroy* and in D-1639 is that the groundwater in question must be flowing in the channel. (Wat. Code, § 1200; *Pomeroy*, at 124 Cal. 597, 632.) ~~The SWRCB finds that this element is satisfied with respect to the water extracted by North Gualala's wells.~~

4.3.1 Water is Flowing in a Subterranean Channel under Elk Prairie

The evidence shows that groundwater is flowing in the subterranean channel at Elk Prairie beneath North Gualala's property. (R.T., pp. 92-93; DFG 1, p. 8; Permitting Team 1, p. 5.) Contours of equal groundwater elevation based on measurements in North Gualala's wells demonstrate that the groundwater flows generally from the northeast to the southwest. (R.T., pp. 41, 97, 168; NGWC 8, pp. 14-15, Figs 4-4 and 4-5.) Groundwater flow direction beneath North Gualala's property varies slightly from the southwest in the northern portion to predominately south on the west end adjacent to the North Fork Gualala River. (R.T., pp. 40-42, 47, 168; NGWC 8, Figs. 4-4 and 4-5.) The direction of flow of the groundwater results from the groundwater flowing from relatively higher to lower elevations. (R.T. p. 63; DFG 1, p. 8.) Any water that discharges into the subterranean stream flows in the stream from a higher to lower elevation after it enters the channel.

North Gualala contends that the water extracted at its pumps is not part of a subterranean stream because the flow at the pumps deviates from the alignment of the subterranean channel. (R.T., pp. 51-53.) This contention is based on North Gualala's conclusion that the groundwater flow direction at the pumps is not parallel to the channel.[6] (Ibid.) The fourth element in D-1639 however, does not require that the flow direction within the subterranean stream be parallel to the channel. (SWRCB Decision 1639, p. 4.) Further, any directional deviation of the subterranean streamflow from parallel to the channel is irrelevant to the issue of whether North Gualala's wells are taking water from a subterranean stream in a known and definite channel. Nothing in Water Code section 1200 or in the discussion of subterranean streams in the case law requires that a subterranean stream exactly follow the course of the channel. Therefore, the test is satisfied as long as the water is flowing within the channel.[7]

Once water is flowing in the subterranean channel, it is part of the subterranean stream, and is subject to the permitting authority of the SWRCB. As discussed above in section 4.1.2, it is undisputed that Wells 4 and 5, and proposed Wells 6 and 7, take water from the alluvium. Based on the above discussion, the evidence in this case is sufficient to establish that the water extracted by North Gualala's wells is flowing in the subterranean channel. This evidence meets the fourth element of the test set forth in D-1639, that the groundwater must be flowing in the channel. The evidence also meets the burden of proof stated in the *Pomeroy* trial court's jury instructions, since the groundwater is flowing in a defined channel. Finally, the evidence overcomes the presumption stated in the *Pomeroy* jury instructions that the groundwater is not part of a stream or water course, nor flowing in a definite channel.

[6] The DFG's expert witness provided testimony explaining why the groundwater near North Gualala's wells is not parallel to the subterranean channel. DFG's expert witness testified that groundwater flows predominantly from east to west just upstream of North Gualala's production wells. (R.T., pp. 206-208.) When groundwater encounters the clay sediments under Elk Prairie near the wells, it is deflected south towards the river. (R.T., p. 210; DFG 25.)

[7] This test is also consistent with the behavior of a surface stream. In a surface stream, the flow may deviate or even reverse at points from the general direction of flow as water enters from a tributary, flows around a barrier, or moves along the bottom of the stream. Likewise, such deviations may occur in a subterranean stream.

4.3.2 Potential Sources of Water in Alluvium

Both parties presented evidence as to the source of the groundwater in the subterranean channel. North Gualala contends that both groundwater and stream flow are maintained by subsurface flow from fractures in the bedrock. (R.T., pp. 55-56, 72-73; NGWC 7, p. 31.) The DFG argues that the source of water entering the subterranean stream comes from recharge from surface water through the sand and gravel bed of the stream channel, subsurface flow from the subterranean channel alluvium upstream, or a combination of both. (DFG 1, p. 10.) While there has been much discussion and evidence of sources of groundwater in the subterranean stream, it is immaterial in determining whether any of the four elements summarized in D-1639 and discussed in the case law are satisfied. Once the groundwater has entered the channel, regardless of the source, it is flowing in a subterranean stream.[8]

~~**4.3.1 Water is Flowing in a Subterranean Channel under Elk Prairie**~~

~~The evidence shows that groundwater is flowing in the subterranean channel under the North Fork Gualala River at Elk Prairie. (R.T., pp. 92-93; DFG 1, p. 8; Permitting Team 1, p. 5.) The contours of equal groundwater elevations beneath Elk Prairie indicate that the groundwater flow direction is generally from the northeast to southwest. (R.T., p. 168; NGWC 8, p. 14.) Groundwater may discharge to the river along the entire reach adjacent to Elk Prairie under both high and low flow conditions. (R.T., p. 56; NGWC 8, p. 14.) Groundwater flow direction varies slightly from southwest in the northern portion of Elk Prairie to predominately south on the west end of the part of Elk Prairie adjacent to the North Fork Gualala River. (R.T., pp. 40-42, 47, 78-79, 167-168; NGWC 8, Figs. 4-4 and 4-5.) Groundwater flows predominantly from east to west just upstream of North Gualala's production wells. (R.T., pp. 206-208.) When groundwater encounters the clay sediments under Elk Prairie near the wells, it is deflected south towards the river. (R.T., p. 210; DFG 25.) Meanwhile, the surface flow is generally moving from northeast to southwest until it reaches the San Andreas Fault and turns south.~~

[8] In accord, jury instruction 16, in *Pomeroy* (124 Cal. 597 at 624), states, "If such water course exists, it is immaterial, so far as the water course is concerned, from or through what lands the waters flow in reaching the channel, or whether they reach the same by percolation or by clearly-defined streams."

The direction of flow of the groundwater results from the groundwater flowing from relatively higher to lower elevations. (DFG 1, p. 8.) Fine grained clay sediments in the upper portion of the alluvial aquifer may influence groundwater flow direction, resulting in deviations from the exact flow of the thread of the surface stream. Groundwater discharges into the alluvium under the North Fork Gualala River and then moves downstream to Elk Prairie in a southwesterly direction. (R.T., pp. 97-98.)

North Gualala argues that the direction of the subterranean flow, since it deviates from the surface flow, means it is not flowing in a subterranean stream. DFG, however, points out that the subsurface water level measurements are taken only in the subterranean channel alluvium; North Gualala has presented no data on bedrock groundwater levels or gradients. Thus, the direction of groundwater gradient North Gualala infers from well water levels applies only to the relatively small area of the alluvium in the immediate vicinity of North Gualala's well field.

The direction of flow from the bedrock, if it exists, is unknown, and no data exists to determine the flow direction of groundwater coming from fractures in the bedrock. (R.T., pp. 56-57; DFG 1, p. 15.) The DFG witness testified that if recharge of the subterranean stream occurs from the bedrock, it is only a minor amount. (R.T., pp. 121-122.)

Any deviation of the subterranean stream from the surface flow is irrelevant to the issue of whether North Gualala's wells are taking water from a subterranean stream flowing in a known and definite channel. Nothing in Water Code section 1200 or in the discussion of subterranean streams in the case law requires that a subterranean stream exactly follow the course of a related surface stream. In any event, the subterranean stream in question does generally follow the course of the North Fork Gualala River in a southeasterly direction, with minor variations that apparently are the result of subsurface clay deposits or deviations in the subterranean course of the channel compared with the thread of the surface stream. (R.T., p. 210; DFG 25.) A little farther downstream than where North Gualala asserts the subterranean flow moves south, at the west end of Elk Prairie, the surface stream turns south at the San Andreas Fault. (R.T., pp. 98, 109; NGWC 9.) In surface streams, the flow may deviate or even reverse at points from the general direction of flow as water enters from a tributary, flows around a barrier, or moves along

~~the bottom of a stream. Likewise, such deviations may occur in a subterranean stream. The practical question to be answered by the test stated in D-1639 is whether the subterranean stream is behaving like a surface stream. In this case, the evidence shows that it is behaving like a surface stream.~~

~~North Gualala's argument that the water extracted at the pumps is not part of the subterranean flow fails. If water flows from fractures in the bedrock at Elk Prairie, then groundwater would flow from the bedrock, which is the boundary of the channel, into the alluvium, which fills the channel. The evidence is that the water may flow toward the subterranean stream, but the water does not flow away from the subterranean stream . (R.T., pp. 47, 256-257.) Once water is flowing in the subterranean channel, it is part of the subterranean stream, and is subject to the permitting authority of the SWRCB. As discussed above in section 4.1.2, it is undisputed that Wells 4 and 5, and proposed Wells 6 and 7, take water from the alluvium.~~

~~**4.3.2 Potential Alternative Sources of Water in Alluvium**~~

~~North Gualala contends that during the dry season, both groundwater and stream flow are maintained by subsurface flow from the basement complex. (R.T., pp. 55-56, 72-73; NGWC 7, p. 31.) North Gualala argues that the combination of perennial stream flow in the North Fork Gualala River, supported only by discharge from the Franciscan bedrock beneath and east of Elk Prairie after the end of the rainfall/runoff season, and a sustained groundwater gradient nearly perpendicular to the River at Elk Prairie, are evidence of both the water storage and water yielding characteristics of the Franciscan bedrock in those areas. (R.T., pp. 72-73; NGWC 7, p. 8.) Discharge of groundwater from springs and seeps emanating from fractured rock aquifers within the Franciscan bedrock surrounding the Elk Prairie site may add significant quantities of surface water flow to the adjacent streams and rivers. (R.T., pp. 252-253; NGWC 2, p. 10.) As explained above in section 4.3.1, however, any water that discharges into the subterranean stream flows in the stream from a higher to a lower elevation after it enters the stream. Thus, the water gathers in the subterranean stream from the surrounding bedrock, much as water on the surface gathers in a surface stream, and flows from that point in the stream.~~

~~Another possible source of water in the subterranean stream is water-bearing fractures within the Franciscan bedrock. (R.T., pp. 25-26; NGWC 2, p. 10.) Studies done on wells completed in the Franciscan bedrock indicate that some wells can produce pumping rates in excess of 50 gpm. (NGWC 2, p. 7.) The nearest such well in this study, however, is approximately 15 miles from Elk Prairie. (R.T., pp. 174-175; NGWC 2, Fig. 1.) No data presented in the hearing demonstrates that groundwater in the Franciscan bedrock contributes to flow in the alluvium of the subterranean channel. The evidence shows, however, that the bedrock does contain water on both sides of the canyon. (R.T., pp. 258-259.) If the groundwater flows from the Franciscan bedrock into the alluvium, it passes the boundary of the channel and flows into the subterranean stream. Even if fractures are the source of a significant part of the water flowing in the channel under Elk Prairie, that water is nevertheless flowing in a subterranean stream once it has passed into the channel.~~

~~No evidence supports a flow of groundwater from the alluvium into the Franciscan bedrock. Further, North Gualala's witness specifically stated, in response to cross-examination, that no flow goes back into the bedrock . (R.T., pp. 256-257.) This establishes that the water in the channel is not percolating groundwater, despite the possibility that it may have been percolating groundwater until it entered the channel.~~

5.0 CONCLUSION

The SWRCB concludes that a subsurface channel exists under Elk Prairie. The subsurface channel has relatively impermeable bed and banks that demonstrate a significant difference in permeability between the Franciscan bedrock and the alluvium filling the channel. The course of the channel is known by reasonable inference, by projecting the slopes of the canyon to a point where they meet beneath the alluvium. Groundwater is flowing in the subterranean stream formed by the channel. Flow direction of groundwater at any given point may deviate from the course of the subterranean channel. However, there is nothing in either the four elements of the test set forth in D-1639 or in *Pomeroy* that requires that the subterranean streamflow be entirely coincident with the course of the subterranean channel. ~~The exact course of the subterranean stream may vary slightly from the course of the surface stream above it. However, the subterranean stream does not have to follow a surface stream in order to be a subterranean~~

~~stream, and the courses of the two streams are remarkably similar notwithstanding that the subterranean stream may turn southward a little before the surface stream turns southward.~~

ORDER

IT IS HEREBY DETERMINED, that the groundwater pumped by production Wells 4 and 5, and proposed production Wells 6 and 7 of North Gualala Water Company in the Elk Prairie along the North Fork Gualala River is extracted from a subterranean stream flowing through a known and definite channel. Accordingly, North Gualala Water Company must have a permit or permits to appropriate water through these wells and must comply with the terms of such permit or permits.

CERTIFICATION

The undersigned, Clerk to the Board, does hereby certify that the foregoing is a full, true, and correct copy of an order duly and regularly adopted at a meeting of the State Water Resources Control Board held on February 19, 2003.

AYE:

NO:

ABSENT:

ABSTAIN:

_____

Maureen Marché
Clerk to the Board