

IN THE MATTER OF APPLICATION NOS. 14109,
TO 14113, INCLUSIVE, IN NAME OF ANACONDA
COPPER MINING COMPANY TO APPROPRIATE
UNDERGROUND WATER FOR MINING, MILLING AND
DOMESTIC PURPOSES, LYON COUNTY, NEVADA.

RULING

On March 12, 1952 Anaconda Copper Mining Company filed Applications Nos. 14109, 14110, 14111, 14112, and 14113 to appropriate ground water for mining, milling and domestic purposes. The amounts of water applied for, together with the proposed points of diversion, are as follows:

Application No. 14109 to appropriate 1.10 c.f.s. of water at a point within the SE $\frac{1}{4}$ NW $\frac{1}{4}$ Section 21, T. 13 N., R. 25 E.

Application No. 14110 to appropriate 1.10 c.f.s. of water at a point within the SW $\frac{1}{4}$ NE $\frac{1}{4}$ Section 21, T. 13 N., R. 25 E.

Application No. 14111 to appropriate 1.67 c.f.s. of water at a point within the NW $\frac{1}{4}$ NE $\frac{1}{4}$ Section 21, T. 13 N., R. 25 E.

Application No. 14112 to appropriate 2.22 c.f.s. of water at a point within the NW $\frac{1}{4}$ NE $\frac{1}{4}$ Section 21, T. 13 N., R. 25 E.; and

Application No. 14113 to appropriate 1.10 c.f.s. of water at a point within the SW $\frac{1}{4}$ SE $\frac{1}{4}$ Section 16, T. 13 N., R. 25 E.

Notices of the applications were published in the Mason Valley News, a weekly newspaper printed and published in Lyon County, Nevada, for the statutory period, the last date of publication being on April 11, 1952.

On May 9, 1952, and within the legal time within which protests to the granting of permits to appropriate water under such applications could be filed, protests to the granting of permits under Applications Nos. 14109 to 14113, inclusive, were filed by the Walker River Irrigation District, and by A. L. Farias. The reasons set forth in the protests by both protestants were identical and were as follows:

1. That the withdrawal of the water applied for, and for the uses set forth in the application, will deplete the underground water reserves of adjacent and adjoining agricultural lands, lower the water table below the point now maintained and necessary for the agricultural purposes to which such lands are devoted, require a more frequent use of irrigation and a consequent increased use of the waters of the Walker River stream system, all of which will be to the detriment, and cause irreparable injury, to the protestant, and all other users of decreed and storage water within the area.

2. That in the event said application is granted over the protest herein made; considerable quantities of water in excess of the needs of the applicant, will be developed and which excess will be lost to beneficial use, unless the same be returned to the Walker River for the use and benefit of all of the users of decreed and storage waters on said stream system. That in the event such application is granted over this protest all unused waters developed by the applicant should be, by order of the State Engineer's office, required to be returned to the Walker River.

On Friday, May 23, 1952, Hugh A. Shamberger, State Engineer, accompanied by Mr. Omar Loeltz, Acting District Engineer, U. S. Geological Survey, Ground Water Division, made a field investigation of the applications. Also present were officials of the Anaconda Copper Mining Company; Protestant A. L. Farias; and Protestant Walker River Irrigation District represented by its board of directors, attorney and secretary-manager.

The matter of acting on these applications is now before the State Engineer.

PROPOSED WATER DEVELOPMENT

The Anaconda Copper Mining Company is in the process of mining a large copper deposit by open-pit methods. A large townsite has been constructed westerly of the mining area for housing the employees of the company. A large ore beneficiation plant is under construction northwesterly of the pit site.

The purposes of the proposed diversion of ground water are two-fold: (1) To furnish water for the townsite, mining and milling operations; and (2) to lower the water table in the pit area sufficiently to allow for mining operations.

From data obtained during the exploration period the Company determined that the water table within the pit area could be lowered by constructing five wells around the southeasterly perimeter of the pit area. The proposed wells were numbered counter-clockwise, starting with Well No. 1, (Application 14109) the most southerly well. The surface elevation at this well site is 4,450 feet and is about 2,000 feet westerly of the Walker River. Well Site No. 2 (application No. 14110) has a surface elevation of 4,417 feet and is about 800 feet westerly of the river. Well Site No. 3 (Application No. 14111) has a surface elevation of 4,415 feet and is about 950 feet westerly of the river. At Well Site No. 4 (Application No. 14112) the surface elevation is 4,451 feet and is approximately 1,300 feet westerly of the river. Well Site No. 5 (Application No. 14113) is the most northerly well with surface elevation of 4,437 feet and being about 2,000 feet westerly of Walker River.

The water from the wells will be pumped to a central gathering reservoir located near Well No. 4. From this reservoir water will be pumped to the plant head tanks, and also to the townsite. The excess water not needed for beneficial use is to be conveyed

to the Walker River.

STATISTICAL DATA

Prior to the construction period now under way, the Anaconda Copper Mining Company carried on a rather extensive exploration program which included test drilling. A number of test wells were drilled and studies made to obtain the hydrologic characteristics of the formation. This information was made available to the State Engineer.

The regional water level, as indicated by six test holes, varied between elevations of 4,378 and 4,380.9, and averaged 4,379.8 feet above sea-level. From the well log furnished this office by the licensed well driller on Well No. 1 drilled at the point of diversion described in Application No. 14109, water was first struck at 90 feet below the surface (elevation 4,360 feet) and rose to 70 feet below the surface. This indicates an artesian pressure and the water levels averaging 4,379.8 feet in elevation would better be described as the piezometric water level. The flow line elevation of the Walker River is about 4,380 feet which indicates that the bed of the river is about the same elevation as the piezometric surface of the ground water, and at Test Well No. 1, mentioned above, ground water was encountered at elevation 4,360 feet or some 21 feet below the river bed and then rose in the well to approximately river bed elevation.

An eight inch test well was drilled at the location given in Application No. 14109 and which was designated Test Well No. 1. The well was drilled to a depth of 245 feet (to elevation 4,205). Bedrock was encountered at a depth of 130 feet (elevation 4,320) from the surface. This well tested 405 gallons per minute with a drawdown of 45.1 feet. This indicates a specific capacity of 9 gallons of water per minute per foot of drawdown. This pumping had little affect in most of the adjacent area, showing a drawdown of 0.1 foot to 0.4 foot in four of the nearby holes. The well was then plugged with dirt, sand, and cement approximately 5 feet below the top of bedrock (elevation 4,315 feet and being 65 feet below the bed of the Walker River) and again test pumped. With a drawdown of 46 feet the discharge averaged 85 gallons per minute, showing a specific capacity of less than 2. This would indicate that when the well was being pumped at a rate of 405 gallons per minute, about 79 percent or 320 gallons per minute was obtained from bedrock formations and 85 gallons per minute, or 21 percent was obtained from the alluvial fill. Water Well No. 1, drilled at the same location as Test Well No. 1, was drilled to a depth of 314 feet and cased with 14 inch casing to a depth of 193 feet and with 12 inch casing to a depth of 286 feet. The well was test pumped at 600 gallons per minute with a drawdown of 14 feet. From information obtained from Test Well No. 1, the major portion (79 percent) of this water was obtained from bedrock formations. During the test pumping period no affect on the water level in nearby wells was noticed.

Two other test wells were drilled in the westerly portion of the open pit area at distances of approximately 2,000 and 2,500 feet westerly of Well Site No. 4 (Application No. 14112). The wells were drilled to depths of about 260 feet below the bed of the Walker River. In one of these wells the drawdown was immediate and the pump was sucking air within five minutes. In the other well the pump discharge was 156 gallons per minute with a drawdown of 81.5 feet, indicating a specific capacity of less than 2.

FINDINGS

From the information obtained, it is our opinion that the contemplated operations by the Applicant under Applications Nos. 14109 to 14113, inclusive, would have little affect, if any, on the river flow in the Walker River. It seems apparent that the bulk of the water would be drawn from the bedrock formations.

I recognize the apprehension on the part of the protestants. In this instance the waters of the Walker River have been adjudicated. If the pumping of ground water from the river plain was, in effect, taking water that was tributary to the river, and if such operations were large there naturally would be some affect on the river flow. If the affects were large, downstream rights from the river flow would be jeopardized.

Within some river basins there is a close inter-dependence of the ground water flow and the surface flow. However, for this to occur there must be a hydraulic connection between the river and the pumping area.

Each individual case must be considered separately. Within some of our Nevada river basins the alluvial fill for some distance from the river is composed of highly permeable material with a direct hydraulic connection with the river. Pumping of ground water could affect the river flow. The extent of the affect, and the time interval, would depend on the rate of pumping, transmissibility, and the distance of the well from the river. A general rule where aquifers yield water at a rate satisfactory for irrigation purposes is that a well located one mile from the river and pumping continuously would diminish the flow of the stream after one year of pumping to the extent of about 28 percent of the average rate of pumping. If the well was located five miles from the stream the decrease of stream flow would be less than one percent of the rate of pumping after one year and about four percent in five years. Most of the pumping in Nevada is for irrigation purposes and is seasonal in character. Also, our Nevada streams have flood conditions which would recharge the ground water reservoir during the off-season pumping period. In such cases, if the wells were located a sufficient distance from the river, pumping operations would not materially affect the river flow.

In the case at hand it appears that the hydraulic connection between the proposed pumping area and the river is extremely poor. The drawdown of water in the test wells when pumping from the alluvial fill was large, indicating material of low permeability. The gradient between the water level in the wells and the river is almost flat.

This, coupled with the low permeability, indicates that very little water is now reaching the river from the proposed pumping area. Pumping operations will lower the water table so that there may be a gradient developed from the river to the pumping area. However, with the low permeability, the amount of river water reaching the area would be negligible.

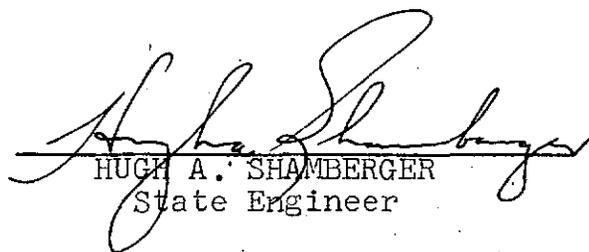
I, therefore, find that the pumping of water from wells as applied for under Applications Nos. 14109 to 14113, inclusive, would not be detrimental to the river flow.

Under the plans of the applicant, water pumped in excess of its needs will be returned to the river. This, of course, would be in the interest of conservation and will be required.

RULING

On the basis of the findings, the protests of the Walker River Irrigation District and A. L. Farias are herewith overruled on the grounds that the granting of permits under Applications Nos. 14109 to 14113, inclusive, would not be detrimental to their interests. Permits will be granted subject to any prior rights that may exist and further subject to the conditions that the applicant make provisions to return the excess water to the Walker River, and further that applicant keep an accurate record of water pumped and used beneficially as well as excess water.

Respectfully submitted,


HUGH A. SHAMBERGER
State Engineer

Dated July 9, 1952