

251 FINANCE BUILDING  
170 12TH STREET S.E.

STATE OF OREGON  
STATE ENGINEER  
WATER RESOURCES DEPARTMENT  
SALEM

REFER TO  
FILE NO. \_\_\_\_\_

December 18, 1959

Mr. Lewis A. Stanley  
State Engineer  
Salem, Oregon

MEMORANDUM ON THE ARTESIAN FLOW AT MT. ANGEL WELL NO. 3

An examination of the Mt. Angel City Well No. 3 was made on the morning of December 17, 1959, to learn more about the water quality problem that exists at this well. Information was obtained from Mr. William Bean, Mayor, and Mr. Pete Meissner, water superintendent.

This well, which was constructed under State Engineer Permit No. G-296, was drilled to a depth of 492 feet by the Arrow Drilling Co. in 1956. The log of this well, which is attached to this memorandum, shows that the well penetrates several gravel strata in the upper 250 feet and a broken basalt aquifer at the bottom. The static water level when the well was at a depth of 150 feet was 30 feet below land surface. Upon completion of the well at 492 feet, it had an artesian flow of 75 g.p.m. The head on the artesian zone was sufficient to cause the well to flow when the top of the casing extended to 10 feet above land surface.

The City Water Department was troubled with a fine grained volcanic ash in this well that discolored the water to a point where the well was unusable. In 1957, the R. J. Strasser Drilling Co. was employed by the City to repair the well. The old casing was pulled and the well was recased to a depth of 488 feet. This new casing was perforated opposite several of the water bearing gravel strata but the location of these perforations is not known. The water eventually cleared up and the well was put into operation.

As the well drillers advised the City that they might "lose the well" if it was capped, the city installed a deep well turbine and a small capacity centrifugal pump to utilize all the artesian flow. In this system an automatic switch starts the small capacity centrifugal pump whenever the well starts to flow (see attached sketch). This pumping system

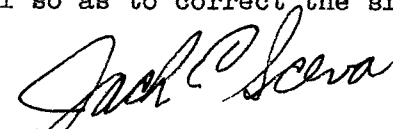
was reported to operate perfectly, however, when only the artesian flow was being utilized, the water quality in the city system became almost unusable because of the presence of hydrogen sulfide in the water. When the turbine pump on this well is in operation the water quality improves and the city is not bothered by complaints from the water users.

It is believed that the artesian aquifer, which is at the bottom of the well, carries the water containing the hydrogen sulfide gas. When the turbine pump is not in operation the artesian flow is derived from the deep aquifer. When the turbine pump is put into operation, sufficient water is developed from the overlying aquifers so as to dilute the artesian water to a point where it is usable.

The City now desires to discontinue the use of the artesian flow so as to eliminate their water quality problem. The artesian flow was estimated to be approximately 50 g.p.m. at the time of my visit. This flow, if continuous <sup>over</sup> ~~of~~ two-thirds of a year (estimated period when turbine pump would not be operated) would amount to approximately 100 acre feet a year.

The closing of the control valves on this well could cause some undesirable effects. The flow at the surface would be eliminated, but because of the difference in static levels, the artesian water would move up the well casing and out into the overlying aquifers. This could change the water quality that would be obtained when the turbine pump is in operation and could also affect the water quality in nearby wells that develop water from the shallower aquifers. The plugging of the Mt. Angel well at the bottom would probably eliminate the water quality problem but it would also reduce the capacity of their well.

As there are no other deep wells developing water from the artesian zone in the immediate vicinity of the city well, the waste of water from this zone may not cause injury to existing wells. I would recommend that, for the time being, this well be allowed to flow. The City should be required, however, to meter the amount of water being discharged to waste so that we would have a record of its magnitude. Should it be found that this waste is causing injury to other wells or depleting the supply in the artesian aquifer, the City should be required to either utilize the artesian flow or plug off the artesian zone in their well so as to correct the situation.

  
Jack E. Sceva  
Geologist

MEAS

ORIGINAL File Original and Duplicate with the STATE ENGINEER SALEM, OREGON

OCT 2 1956

WATER WELL DRILLERS REPORT STATE OF OREGON

Do Not State Well No. 6/W-10P(3) Fill In State Permit No. 9-296

(1) OWNER: Name City of Mt Angel Address MT Angel Oregon

(2) LOCATION OF WELL: D-25-12 #1 County MARION Owner's number, if any... R. F. D. or Street No. CITY OF MT ANGEL Bearing and distance from section or subdivision corner 520 N 8.24' E + 60 FT WESTERLY FROM S.W. corner of Block 14 of Butcher's addition City of Mt Angel to well site

(3) TYPE OF WORK (check): New well [X] Deepening [ ] Reconditioning [ ] Abandon [ ] abandonment, describe material and procedure in Item 11.

(4) PROPOSED USE (check): Domestic [ ] Industrial [ ] Municipal [X] Irrigation [ ] Test Well [ ] Other [ ] (5) EQUIPMENT: Rotary [ ] Cable [X] Dug Well [ ]

(6) CASING INSTALLED: Table with columns for FROM ft. to, Diam., Gage or Wall, Diameter of Bore, from ft. to ft. Includes handwritten entries for 'Top' 325" 10" and '8" FROM 254" TO 461 FT'.

(7) PERFORATIONS: Type of perforator used MILLS KNIFE No. of perforations 3 in., length, by 1 1/2 in. FROM 100 ft. to 110 ft. 2 perf per foot 6 No. of rows... SCREENS: 447 to 460 - 2

(8) CONSTRUCTION: Was a surface sanitary seal provided? [X] Yes [ ] No To what depth 70 ft. Were any strata sealed against pollution? [ ] Yes [X] No If yes, note depth of strata FROM ft. to ft. METHOD OF SEALING Cement

(9) WATER LEVELS: Depth at which water was first found 155 ft. Standing level before perforating - ft. Standing level after perforating 30' at 150' Depth ft. Log Accepted by:

[Signed] City of Mt Angel Dated 9-26-1956 Owner My Joe M. Wagner

(10) WELL TESTS: Was a pump test made? [X] Yes [ ] No If yes, by whom? Metz Schneide Yield: 450 gal./min. with 360 ft. draw down after 24 hrs. Artesian flow 73 gal. before p.m. pumping 720 gal. after Shut-in pressure 0 lbs. per square inch. Bailer test 30 g.p.m. with 70 ft. drawdown Temperature of water 62 Was a chemical analysis made? [ ] Yes [X] No Was electric log made of well? [ ] Yes [X] No

(11) WELL LOG: Diameter of well 10 inches to 395 ft 8" to 492 ft. Total depth 492 ft. Depth of completed well 492 ft. Formation: Describe by color, character, size of material and structure, and show thickness of aquifers and the kind and nature of the material in each stratum penetrated, with at least one entry for each change of formation.

Well Log Table with columns for depth (0 ft. to 492 ft.) and formation descriptions: Top 8' soil, Yellow clay, Blue, Cemented gravel, Blue clay & gravel, Brown silt, Cemented gravel, Blue clay & gravel, Brown clay & gravel, Shale, Blue clay, Blue clay & gravel, Shale, Gravel & water, Mixed clay & gravel, Mixed clay & gravel, Mixed clay, Clay & rock, Gray clay, Sand rock, Broken Basalt Rock.

Ground elevation at well site 138 feet above mean sea level. Work started June 8 1956 Completed Sept 24 1956 Well Driller's Statement: This well was drilled under my jurisdiction and this report is true to the best of my knowledge and belief.

NAME Arrow Drilling & Supplies (Person, firm, or corporation) (Type or printed) Address 729 N MAIN ST Newberg. Driller's well number [Signed] Harkin M. Huffman (Well Driller) License No. 117 Dated Sept 26, 1956

6/iw-10F3  
MARION CO.

# DIAGRAMATIC SKETCH OF PUMPING EQUIPMENT AT MOUNT ANGEL WELL No 3.

