

INVESTIGATIONS

Geology & Ground Water Resources In Vicinity of the Columbia River And Interstate 5, Clark County Washington. No. 3

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An investigation of the geology and ground-water resources along State Highway 205 from the Columbia River to Interstate 5. Testing was done to determine the quantity and quality of ground water available in the area. Prepared by Paul A. Eddy, Office of Technical Services, Department of Ecology, Olympia, Washington, March 1971.

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Purpose and Scope of the Investigation

This study was initiated upon receipt of a letter dated September 17, 1970 sent by the Chief Right of Way Agent, Department of Highways, requesting information about present and future ground-water availability and possible adverse effects which could be incurred by construction of the SR 205 freeway.

The scope of this study was set to include several determinations which are:

1. Ascertain the availability of ground water to the present site.
2. Determine direction of ground-water flow.
3. Conduct a pump test in order to obtain specific information about the well behavior.
4. Determine possible damage to the well by nearby construction.

The study consisted of a general geologic reconnaissance of the area and a pump test of the well in question. Additional information was obtained from the files of the Department of Ecology.

Location and Topography of the Area

The well in question lies geographically near the southwestern edge of Clark County and is within Township 2 North, Range 2 East of the Willamette Meridian, Section 16. The altitude of the well is approximately 215 above sea level and lies on a gentle rolling flatland. The well in question lies approximately 30 feet to the east of the house. (Fig. 1)

Geology and Ground Water

The geology of this area consists of three primary rock units and they are as follows:

Older Consolidated Rocks - Included in this group are the Goble volcanic series, the Eagle Creek formation, the Keechelus andesitic series (Skamania andesite series of Felts, 1939), the Columbia River Basalt, and intrusive rocks of one or two areas such as the Silver Spring granodiorite stock (Felts 1939). With few exceptions these older consolidated rocks crop out only in the foothills and are in areas which are largely uninhabited, the rocks are not economically important as aquifers.

Troutdale Formation - This unit consists of: Semiconsolidated clay, silt, sand, and gravel and is the most widespread formation with its' upper unit considered to be one of the most productive aquifers in the county. Wells drilled into the sand and gravel strata of the upper Troutdale formation generally have a moderate to high permeability thus yielding moderate to large supplies of water except where the unit has been badly weathered.

Pleistocene Alluvial Deposits - This unit also goes by the synonym "Portland Delta Gravels" which are sand and gravel which has a comparatively fresh and unweathered appearance. In general the material is well sorted, but the degree of sorting is much better in the finer grained phases than in the coarse phase. In places the gravels are lightly cemented, but not enough so that the porosity is greatly reduced.

The stratigraphic unit in which this well is located is the Pleistocene Alluvial deposits of the Forth Plains Area. It has been indicated that wells located between Salmon Creek and Burntbridge Creek obtain moderate yields from coarse sand and gravel which are chiefly the result of reworking the alluvial delta deposits and part of the upper member of the Troutdale Formation. The reworked gravels are comparatively shallow, 10-25 feet thick, and apparently directly overlie the Troutdale Formation. (Fig. 2)

This shallow water source is easily polluted from surface contamination and care should be taken when working in close proximity to this type well.

Pump Test Data

It was impossible to gain access to this well. The concrete lid was cemented on to the tile casing and only a 1¼ inch hole was through the lid which contained a 1¼ inch sandpoint that had been placed in the well 18 years ago (reported). However, the well was pump at 2.5 gallons per minute for two hours, during which time no air was pumped. (Fig. 3)

Reported to have never run dry.

Conclusions

Over the 2 hour pump test the well yield was approximately 150 gallons per hour - based on a need of 200 gallons per day per person in the household, this well will produce the amount required (800 gallons per day for a 4 member family) over a 24 hour period. However it is not known if the well will produce this quantity on a continuous basis since the 2 hour pump test produced only 300 gallons.

Since Mrs. Holden is a widow and lives alone it does appear that the well will be adequate for her needs.

The sample tested by the County Health Office indicated that the (M-F) of bacteria of the coliform group had a count which was less than 1 per 100 milliliter. At this level of contamination by non-pathogenic coliforms, the risk of contracting disease by drinking the water is virtually zero.

The general direction of ground-water flow appears to be to the south into Burntbridge Creek. This would indicate that construction probably will not effect the well. However it is recommended that the well be monitored during nearby construction to ascertain that no contamination reaches the aquifer.

REFERENCES

Mundorff, M. J., 1964, Geology and Ground-water Conditions of Clark County, Washington, with a Description of a Major Alluvial Aquifer Along the Columbia River: Washington Department of Conservation Water Supply Bulletin No. 9, pgs. 31, 32, 33 and 49.

Washington State Department of Health, Bulletin ES No. 4, pg. 10.

APPENDIX

FIGURES 1 - 3

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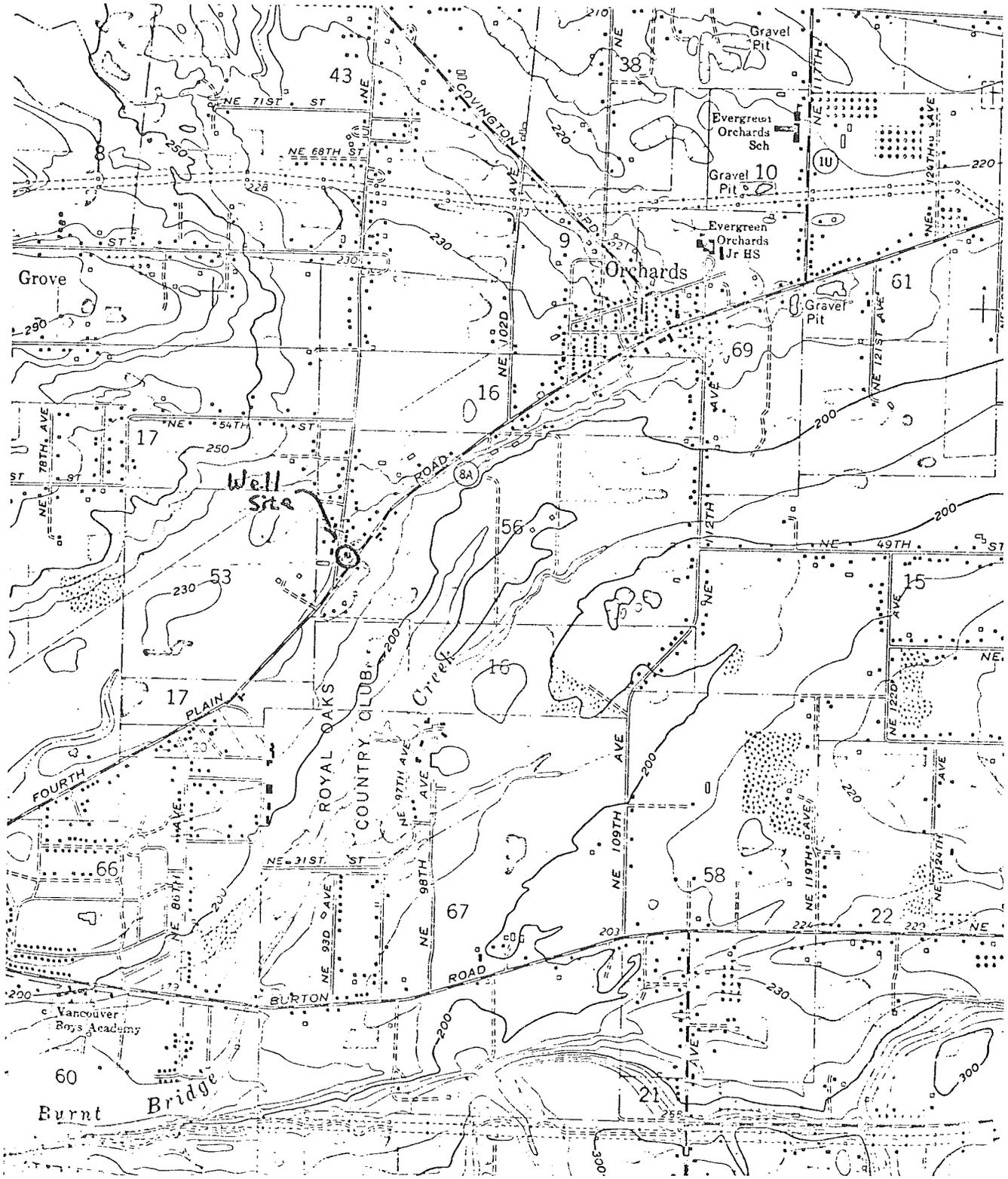


Figure 1a

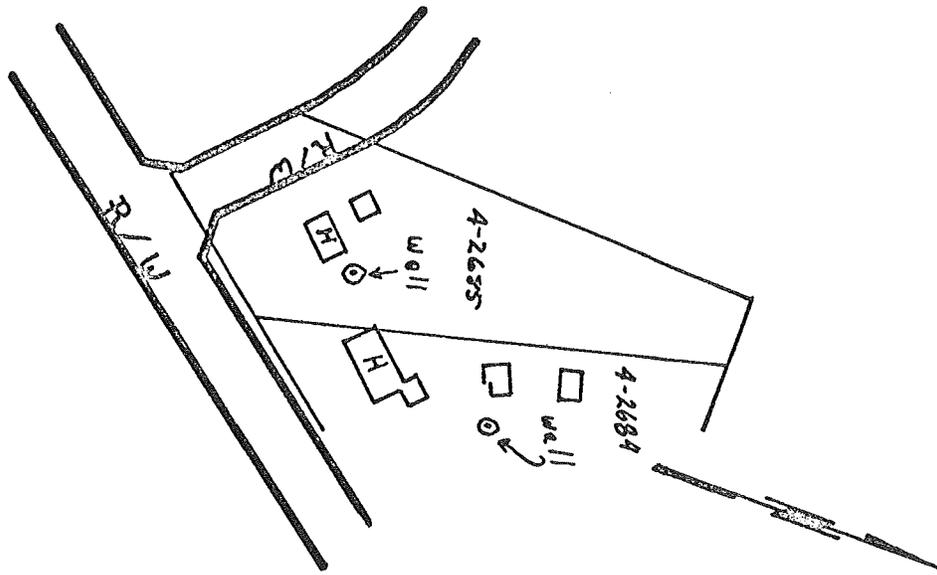
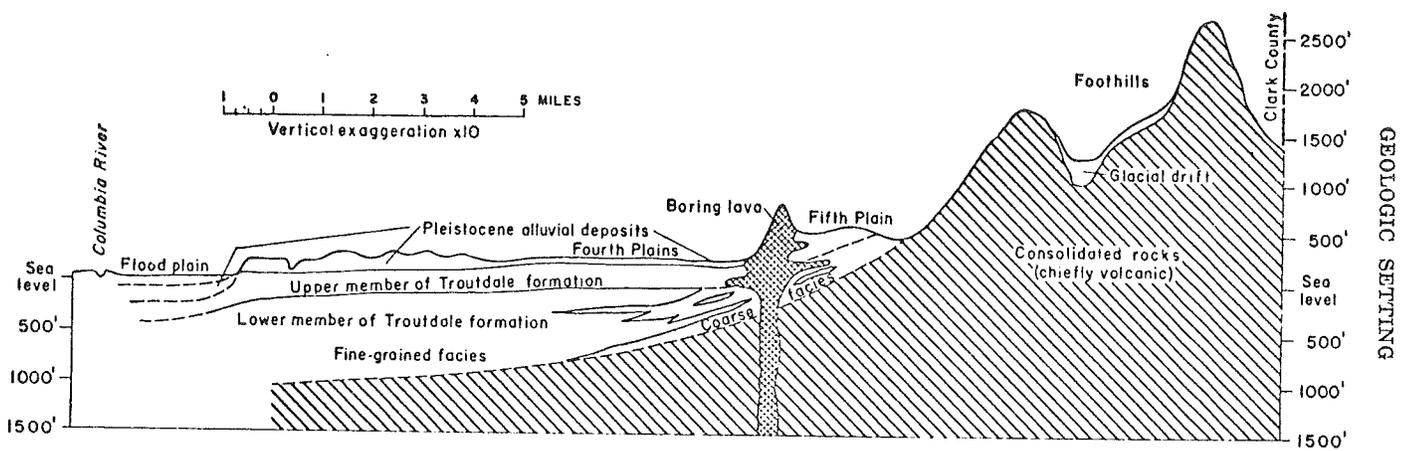


Figure 1



Generalized east-west section across Clark County.

Figure 2

WELL SCHEDULE

Date October 19 71

Record by Paul A. Eddy

Source of data Field

1. Location: State Washington County Clark
 Map Orchards Well No. SW 1/4, NW 1/4, sec. 16, T 2N, R 2E
2. Owner A. M. Holden Address 9414 N. E. 4th Pl
 Tenant _____ Address _____
 Driller _____ Address _____
3. Topography Rolling flatland
4. Elevation 215 ft. ~~153 ft.~~ above Sea level
5. Type: (Dug) drilled, driven, bored, jetted Before 19 49
6. Depth: Rept. 16 ft. Meas. _____ ft.
7. Casing: Diam. 24 in., to _____ in., Type _____
 Depth _____ ft., Finish _____
8. Chief Aquifer _____ From _____ ft. to _____ ft.
 Others _____
9. Water level _____ ft. rept. _____ 19 _____ above below _____
 _____ which is _____ ft. above below surface
10. Pump: Type _____ Capacity _____ G.M. _____
 Power: Kind _____ Horsepower 1/4
11. Yield: Flow _____ G.M., Pump 2.5 G.M., (Meas), Rept., Est. _____
 Drawdown _____ ft. after _____ hours pumping _____ G.M.
12. User: (Dom.) Stack, PS., RR., Ind., Irr., Obs. _____
13. Quality _____ Temp. _____ °C
 Taste, odor, color Good, none, none Sample (Yes) No _____
< 1/100 ml Coliform
14. Remarks: (Log, Analyses, etc.) _____