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January 21, 2005

Mr. Ed Edwards
7360 Shoup Road
Colorado Springs, CO 80908

Re: Preliminary Ground Water Investigation, 50-Acre Eagle Heights Project, El Paso County, Colorado.
Job No. 5717

Dear Ed:

At your request I have prepared this preliminary ground water report for the 50-acre proposed Eagle Heights development in Section 8, Township 12 South, Range 65 West, as approximately outlined on the attached Figure-1. I understand this property may be developed for ten single family homesites plus a community club house. Individual Dawson wells will be the water supply and non-evaporative septic systems and leach fields will be the method of wastewater disposal. There are two registered on-site Dawson wells which are 120 and 200 feet deep. These wells bear permit Nos. 168590 and 168591.

For this investigation I have reviewed my files and those of the State Engineer for geologic, ground water and well information in this area. Subsurface geohydrologic information was obtained from my geophysical log well file and the State Engineer's aquifer computer data base. From this investigation I conclude that (1) a sufficient supply of ground water is contained in the Dawson aquifer beneath the property to meet the 300-year water needs of this planned development, (2) the quality of the ground water in this aquifer should be adequate for domestic purposes and (3) an augmentation plan to use the Dawson ground water will be required prior to final platting of the project.

GENERAL COMMENTS

The subject property, at a surface elevation of 7,450 feet above sea level, is located in the Black Forest. The forested land surface slopes to the southwest and the parcel is drained by Burgess Creek which is a Monument Creek tributary.

The property is underlain by all four of the Denver Basin aquifers. In descending stratigraphic order these aquifers are the Dawson, Denver, Arapahoe and Laramie Fox Hills formations. The base of these respective aquifers should be 800, 1,700, 2,300 and 2,900 feet below the ground surface. All of the aquifers are known to produce ground water and typically in this region wells should yield 50, 15, 200 and 150 gallons per minute from the four respective aquifers. A domestic well yielding 15 gallons per minute is adequate for a single family home.

Ground water availability is computed by multiplying the property area times the formation sand thickness, thence by specific yield (drainable porosity). Based on my geophysical well log file and the State Engineer's aquifer computer data base, I list on the table below my estimates of ground water storage in each aquifer.

Aquifer		Sand Thickness (ft)	Aquifer Storage (af)
Dawson	NNT	335	3350
Denver	NNT	384	3260
Arapahoe	NT	255	2170
Laramie Fox Hills	NT	190	1430
Total			10210

The quality of the water produced from Dawson wells is normally adequate for drinking purposes. Iron is, however, commonly present in Dawson ground water at concentrations slightly higher than the drinking standard, thus prospective home buyers should be advised iron treatment may be necessary. **Prior to platting the project the County will require a water quality analysis from an on-site well.** I suggest you sample the water from one of the existing wells and have the water chemically tested for the minerals and compounds listed on Table I.

WATER SUPPLY DEVELOPMENT

Ground water in all of the above described aquifers receives very little surface water recharge hence the water resource has been identified as "non renewable." The El Paso County Commissioners, in the late 1980's, declared that developments using this water must demonstrate a 300-year supply in order to establish water supply sufficiency.

For this proposed development each homeowner could use up to 0.9 acre feet per year plus the water use at the club house has been set at one acre foot per year. The in-house use would be about 0.3 acre feet per year and the remaining water would be sufficient for the irrigation of about 9,000 square feet of lawn or garden and the watering of four horses. The ten homeowners and club house, therefore, would need about 10 acre feet per year or 3,000 acre feet over 300 years. The needed 300-year supply is about 90 percent of the available ground water in the anticipated Dawson aquifer.

Individual domestic wells normally are drilled for about $12 per foot. An 800-foot deep well on this property would cost $9,600 plus about $3,000 for pumping equipment.

As shown on the above table the Dawson ground water is not non-tributary (NNT) hence to use this supply, you will have to seek approval of a plan for augmentation from the Water Court in Pueblo. This plan has been filed by your water rights attorney, Rob Schween. Since the property now contains 50 acres and ten homes are planned, the Water Court application will have to be amended. Once this occurs, the Court should issued its decree in 9± months.

The existing two wells are permitted as exempt structures. When land on which such wells are located is subdivided the wells can no longer maintain their exempt status and must be included in a plan for augmentation. Once the pending plan for augmentation is decreed, the existing well permits will have to be cancelled and the structures would then be re-permitted under the plan for augmentation.

RECOMMENDATIONS

(1) Have your water rights attorney amend the augmentation plan as outlined above to legalize the use of the Dawson aquifer ground water.

(2) In platting the property care should be exercised to make sure individual wells on the property can be spaced 350 to 400 feet apart to avoid mutual well interference.

(3) When the platting process approaches a final plat, have the water from one of the existing wells chemically tested to learn if iron treatment of the drinking supply will be necessary.

Professional judgements have been expressed in this report. They are based on my understanding of the project requirements and my experience with the aquifers in this area. Well construction and testing will be necessary to verify my preliminary conclusions on well yield and water quality.

I trust this information satisfies your immediate needs. If you have questions, please call.

Very truly yours,

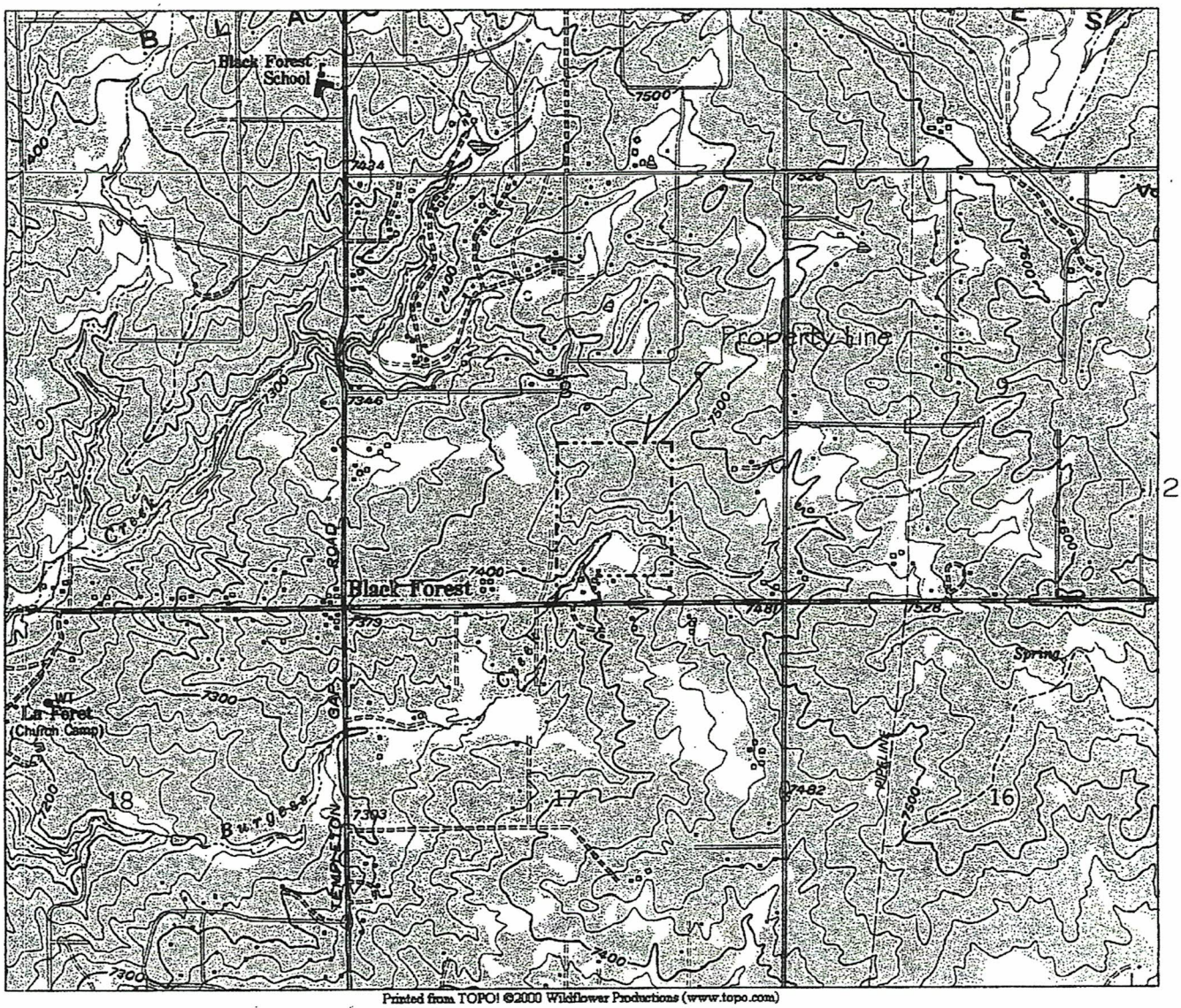
Wm. Curtis Wells & Co.

Wm. Curtis Wells, CPG
Consulting Ground Water Geologist

(2-copies sent)

cc: Rob Schween

R 65 W



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Scale 1" = 2000'

Location Map

Eagle Heights Project

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Figure 1

Table I
Suggested Ground Water Quality Testing

Mineral/Compound	Concentration (mg/l)	
		Upper Limits Drinking Water Standards
TDS		
Calcium		125
Magnesium		
Manganese		
Sodium		
Potassium		
Carbonate		
Bicarbonate		
Sulfate		250
Chloride		250
Nitrate-N		10
Iron		0.3
Arsenic		0.05
Barium		1.0
Cadmium		0.01
Chromium		0.05
Lead		0.05
Mercury		0.002
Selenium		0.01
Silver		0.05
Pesticides		
Endrin		0.0002
Lindane		0.004
Methoxychlor		0.1
Toxaphene		0.005
Herbicides		
2,4-D		0.01
2,4-5TP(silvex)		0.01
Gross Alpha		15
Gross Beta		50