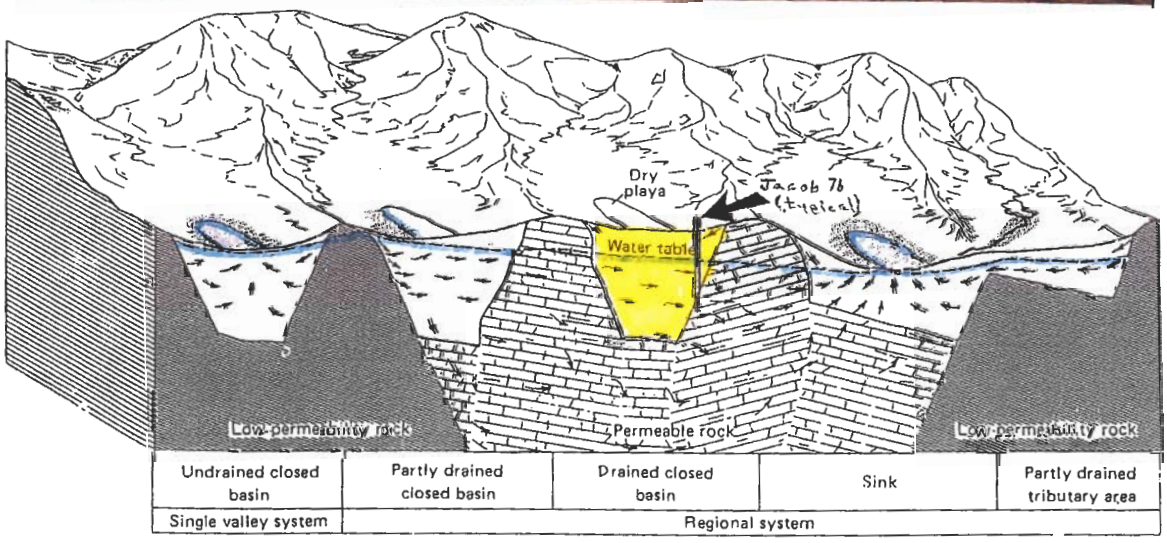
Dry Lake and Delamar Valleys, Nevada

Groundwater Hydrology and Development Potential



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Client: **Beverly Jacob**
5100 Jewell Lane
Lake Oswego, Oregon 97035

Luzier Hydrosciences
2 Gerhwin Court
Lake Oswego, Oregon 97035

between depths of about 540 and 1,000 feet. The first three Jacob wells, located near the east end of the exploration strip, ranged in depth from 560 to 1,000 feet and were "dry" according to the driller.

3. Circulation losses of drilling fluid are caused by zones of high permeability. At the Jacob site, deep alluvial gravel aquifers and tilted, faulted and fractured bedrock layers were detected in the 1995 seismic reflection survey *(Exhibit 3)*.

4. It is my opinion that the steeply tilted beds detected by the seismic survey, consist of carbonate rocks or "limestone and dolomite" layers in accordance with nearby outcrops and subsurface mapping of carbonate rocks by the USGS *(Exhibit 2.1, tan and olive-green patterns, south end of Dry Lake Valley).*

5. Difficult drilling conditions, limited experience of the driller, and limitations of the drilling rig using an 8-inch bit, in general, precluded a full assessment of the production capacity of the alluvial sand and gravel, and/or limestone aquifers at the Jacob site.

6. Measured depths to water-level in well 7b show that groundwater pressures rise with the drilling depth. For instance, at a hole depth of 640 feet on April 28, 2003, the depth to groundwater was 562 feet below the valley floor *(elevation 4,995 feet)* giving a groundwater elevation in well 7b of 4,433 feet *(Exhibit 4 borehole photos).*

7. When well 7b reached depths of about 750 to 790 feet on May 26, 2003, the groundwater-level quickly rose to 47 feet *(depth to water 515 feet)* thereby giving a groundwater elevation of 4,480 feet.

8. The rise in groundwater pressure from a deeper aquifer zone in well 7b, caused heaving of cuttings and plugging of the drill bit. Repeated cleaning efforts and the addition of more than 13,000 gallons of exceptionally thick drilling mud *(which quickly disappeared)* made it impossible to re-establish circulation and proceed drilling deeper. The added volume of mud in well 7b was enough to fill 5,000 feet of 8-inch hole. The greatest mud loss was 48,000 gallons over a one-week period in Well 5 *(until the driller finally stopped trying to plug the aquifer after using enough mud to fill 18,000 feet of 8-inch hole).*

9. Such large mud losses, in my opinion, are more consistent with the presence of laterally and vertically extensive open limestone solution cavities *(tilted beds in Exhibit 3).* Mud loss in alluvial sand and gravel aquifers can usually be controlled.

10. In the earliest study of Dry Lake and Delamar Valleys, the importance of carbonate rocks as major aquifers in the area was recognized by Eakin *(1963, p.9 and 10): "Tschanz 1960, p. 198 indicates that the total thickness of Paleozoic rocks in northern Lincoln County is between 30,000 and 33,000 feet. As described, one may infer that carbonate rocks [limestone and dolomite] probably constitute about 60% [about 20,000 feet] of the total section."*

11. Eakin further concluded *". . . fractures or joints in Paleozoic carbonate rocks locally have been enlarged by solution as water moves through them . . . groundwater-movement through carbonate rocks in this region is assumed to occur both through fractures and solution openings. . . . Certainly, the large quantity of ground water issuing from fractures and solution openings, such as those at Crystal [typically 5,800 gpm or about 9,400 ac-ft/yr, Wilson 2001,*