M E M O R A N D U M

March 22, 1977

To: Stan Springer, Jim Oberlander & Ron Robinson

From: Chuck Cline

Re: Ground-Water Conditions in Area of Swan Creek, Pierce County

On February 15, 1977, Jim Oberlander and I canvassed the area in the vicinity of the Lige Dickson gravel pit operation and Swan Creek, to gather information on wells and springs. There were only a few deep wells; most water sources encountered were either Waller Road Water District connections or shallow dug wells or spring boxes impounding spring water. The three, deep wells located were owned by Harry D. Hughes of 3712-28th Avenue E., Gerald T. Woodard of 2615 40th E. and Loren D. Carlton of 3005 48th St. E. The Hughes well was originally 165 feet deep but may be closer to 155 or 160 feet now. The Woodard and Carlton wells are reportedly at least 150 feet and 174 feet deep respectively. We were only able to measure the water level in the Hughes well (146.65 feet below land surface) because of the inaccessibility of measuring points in the other two wells.

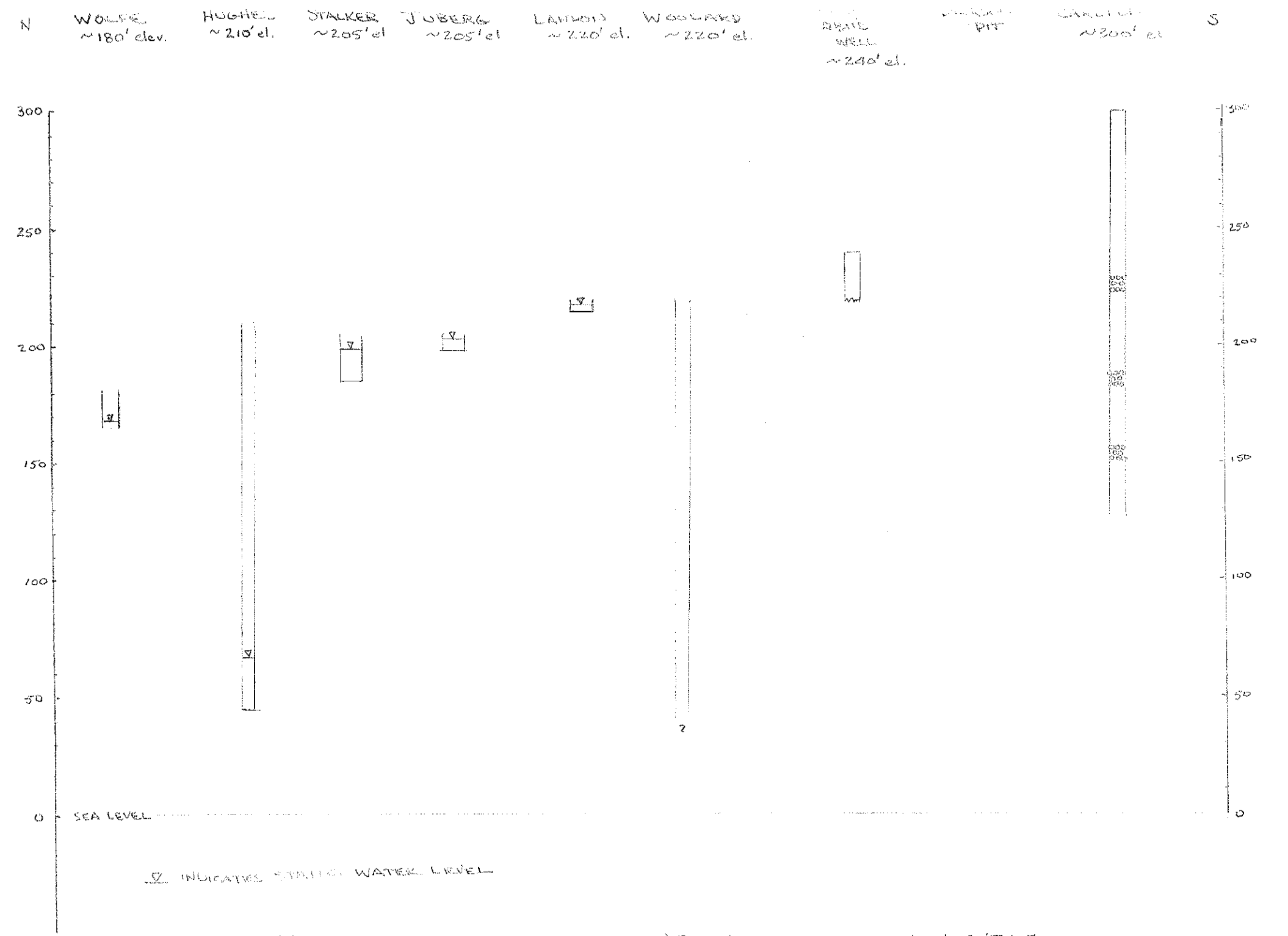
Other measured wells were essentially tapping spring or perched water table sources. The Wolfe (sp. ?) well located at 3704 28th Ave. E. is 15 feet deep with a water level 11.84 feet below land surface. This well was reportedly dug over 33 years ago. The Wolfes (sp. ?) claim to have been short of water at times the last two years. The well owned by E. M. Stalker of 3730 28th Ave. E. is approximately 20 feet deep and has a water level of 5.6 feet below land surface. Mr. Stalker's water is usually low in the summer months; however, he claims he frequently waters his land. Mary Juberg of 3742 28th Ave. E. owns a well which is approximately 6 feet deep; the measured water level is 2.2 feet from land surface. The James Landon well at 2901 40th St. East is a shallow collection box set in the hillside. The water level measured from the lip of the box (1.85 feet above land surface) was 3.35 feet, indicating the spring level was 1.5 feet below land surface. All wells and springs differ in elevation.

Two abandoned wells were also reported in the vicinity of the Dickson gravel pit. Only one of the two wells could be located and an attempt was made to measure the water level. This well is located near the

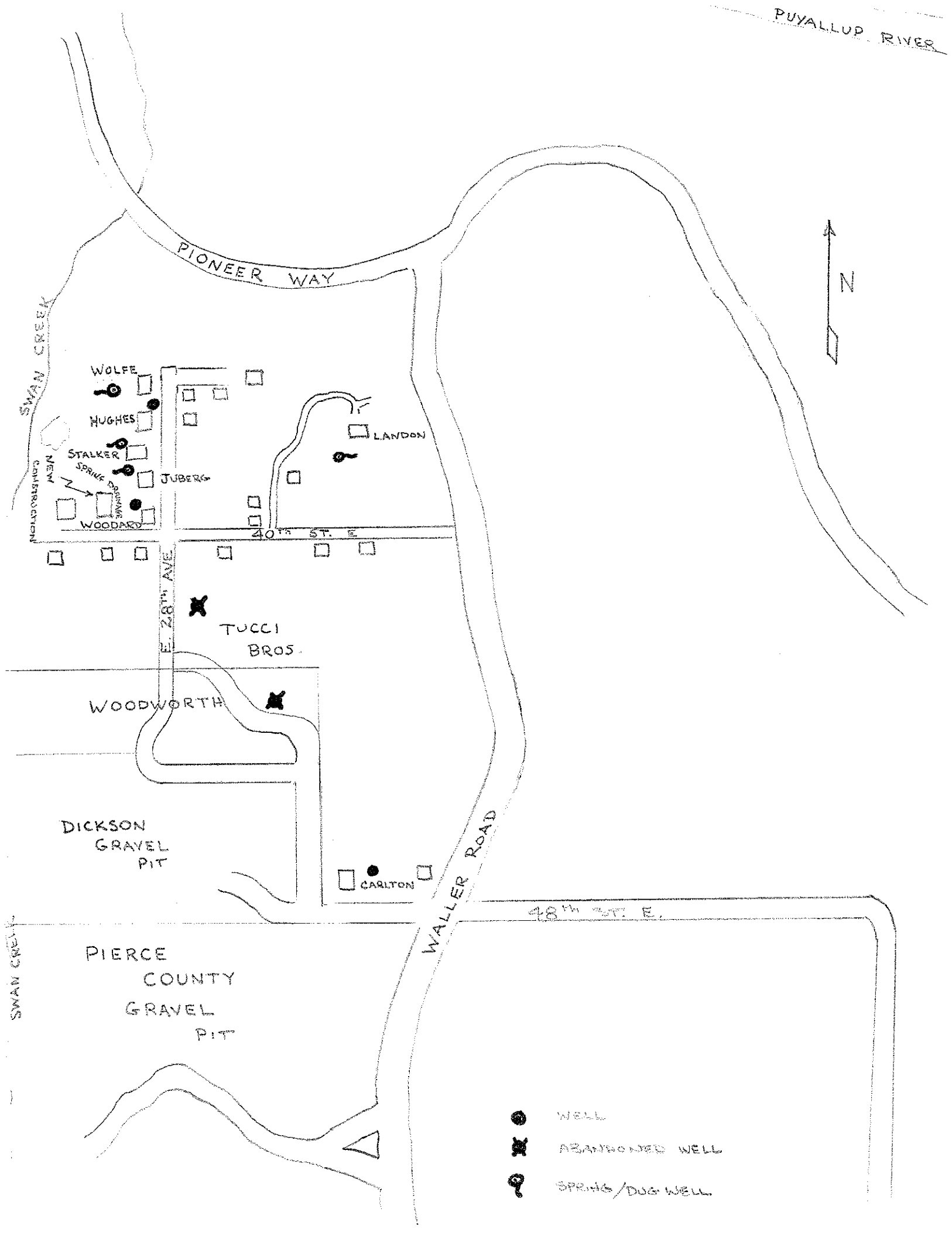
Tucci gravel operation. The abandoned casing protrudes 6 or 7 feet above land surface and was found to be blocked some 17 feet into the hole. No water was encountered.

Based on the data collected and the information available from other reports and observations of the geology exposed in the several gravel pits in the vicinity, an assessment of the ground-water situation may be made. The glacial till, consisting of clay and silt, acts as an impermeable or semipermeable layer below the land surface. Where found, the till retards the downward movement of water and an isolated body of perched or semiperched ground water above the regional ground-water body results. Where permeable sands and gravels, overlying the less permeable silts and clays, are exposed in cuts or sloping valley walls, springs will form, if local precipitation and storage area is sufficient. It might be noted that a ditch was required on Woodard property to remove excess spring water interfering with construction of a new building. The till and overlying gravels are exposed at differing elevations and the various geologic units lens out at irregular intervals. The various spring wells are an indication of the perched water conditions existing in this area.

The deeper wells reflect the regional water conditions. The Hughes well has a water level between 146 and 147 feet. The Woodard and Carlton wells are reported at least 150 to 174 feet deep respectively. They are both cased and probably encounter water at those depths. The Hughes well is approximately 210 feet above sea level which would place the water level at about 65 feet and the casing depth at 45 feet above sea level. The Woodard well is estimated to be 220 feet above mean sea level which would place casing depth at the most, 70 feet elevation and perhaps 40 feet if the well depth of 180 feet reported by William Dickson (letter dated 2/15/77) is correct. The driller's log indicates the Carlton well is cased down to approximately 120 to 130 feet elevation and is perforated at several different levels. This would indicate that an aquifer exists in this area at approximately 40 to 70 feet above sea level near E. 28th Ave. and 40th Street E. and 120 to 130 feet near the Dickson Pit. Elevation estimations for the various spring levels down-gradient from the Dickson Pit reveal them to be above the 170 foot contour. Springs exposed along Swan Creek near the Pierce County gravel pits are between 210 and 230 feet above mean sea level as recorded by Pierce County surveyors (Report available from Consoer, Townsend and Associates, Consultants). The creek elevation is 190 feet along this same survey line.



VARIOUS WELL ELEVATIONS AND WATER LEVELS

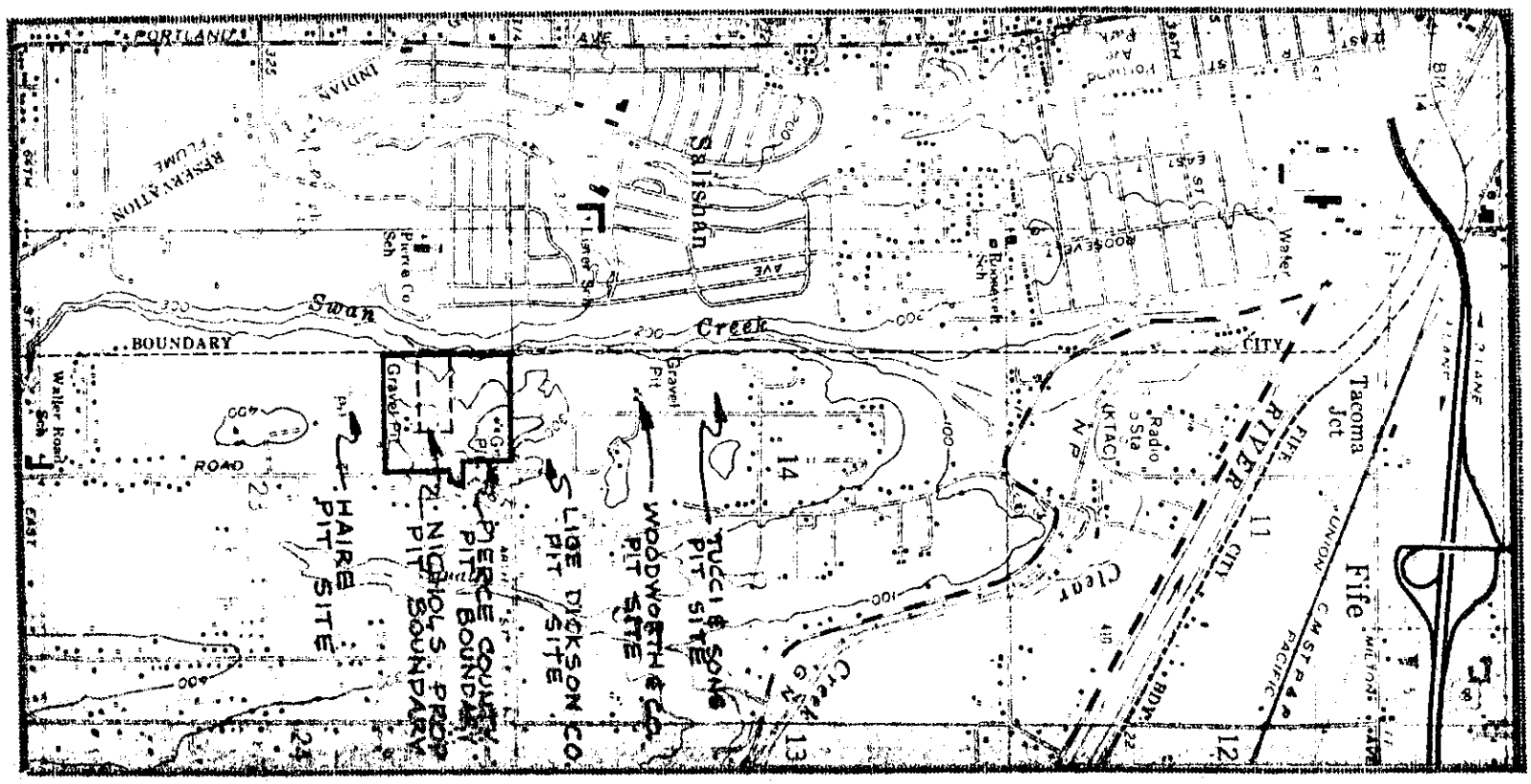

PUYALLUP RIVER
PIONEER WAY
SWAN CREEK
N
WOLFE
HUGHES
STALKER
JUBERG
NEW CONSTRUCTION
SPRING DRAINAGE
WOODARD
LANDON
40TH ST. E.
E. 28TH AVE
TUCCI BROS.
WOODWORTH
DICKSON GRAVEL PIT
CARLTON
WALLER ROAD
48TH ST. E.
SWAN CREEK
PIERCE COUNTY GRAVEL PIT
WELL
ABANDONED WELL
SPRING/DUG WELL

PLAN		BY	DATE
NOTE BOOK	SURVEYED		
No.	PLOTTED		
	ALIGNMENT CHECKED		
	RT. OF WAY CHECKED		

290

280

VICINITY MAP



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SUMMARY

The reconnaissance made on February 15, 1977 indicates many springs in the proximity of Waller Road and Swan Creek. These springs are localized and originate when precipitation, percolating downward through permeable soils, sands and gravels, encounters less permeable clays and silts and forms several perched water tables. The lensing of the till and more permeable sands and gravels is unpredictable and thus springs may occur at various elevations but generally above the 170 foot level. The regional aquifer is probably found at an elevation between 40 and 70 feet in the immediate area with perhaps a large perched zone at approximately 120 to 130 feet.

CONCLUSIONS

The Dickson gravel pit appears to be far enough removed from observed wells and springs down-gradient to have little effect on water conditions in that area. The water movement in close proximity to the gravel pit is westward or northwestward toward Swan Creek rather than towards any of the wells to the north. The lack of much standing water within the pit, other than recycled asphalt washing waters, indicates a major aquifer has not been encountered. The localized perched waters that sometimes appear as springs within the gravel pit are either from the asphalt pond or precipitation percolating down through the more permeable gravels until clay or silt layers retard the downward movement. The individual springs used for water supply are recharged locally from the higher ground. Although springs within the Dickson pit were nonexistent, the springs in vicinity of 28th Ave. East and 40th Street East were of sufficient quantity to provide for domestic uses.

The driller's log for the Carlton well establishes some control on the geology within the Dickson gravel pit. If much of the gravel, sand and till does not lens out between Swan Creek and the Carlton well, some idea of the location of the individual lithologic units may be gained. The log would provide a possible limiting depth for future excavations.

There is a possibility of the gravel operations interfering with spring flow to Swan Creek. However, percolation of ponded water through the berm should compensate for any losses of spring flow. There is no reason to consider the Dickson pit as an immediate threat to groundwater.